

Vol. LV.]

MAY, 1922.

[No. 708.

THE

ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence¹/₂ Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.
36, Strand, London, W.C. 2.

BIG BARGAIN IN SOUTH AMERICAN BUTTERFLIES.

Have just received a lot of Brilliant Tropical Butterflies that I can offer at £1 16s. per 100. Includes Papilio, Catagramma, Perisame, Batesea, Catopsilia, Heliconidæ, etc., not all perfect, but in good condition. *Lyc. exilis* at 18s. per 100. I also have *Morpho rhetenor*, *sulkowski*, *cypris*, *menelaus*, *amathonte*, etc., and a few ♀ ♀ of same. Send for Price List.

*Dealers or Collectors of Butterflies in India, Java, Oceania, etc.,
please send list of showy butterflies.*

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes
Setting Boards, Larvæ Cages
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

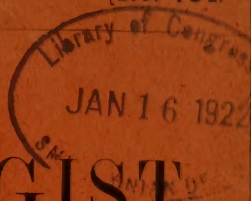
LEONARD TATCHELL, Entomologist
43 SPRATT-HALL ROAD, WANSTEAD, E. 11

Subscriptions for 1922 (12s.) are now due and should be sent to R. South,
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.

Vol. LV.]

JANUARY, 1922.

[No. 704.



THE

ENTOMOLOGIST

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c.

N. D. RILEY, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

DR. D. SHARP, F.R.S., F.E.S., &c.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidopter
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

PUPE: Machaon, Ligustri, Ocellatus, Tiliæ, Populi, Elpenor, Bombyliformis (narrow border), Lanestris, Versicolor, Carpini, Bicuspis, Fureula, Vinula, Fagi, Curtula, Pigra, Batis, Orion, etc. Also Tutt's 'British Lepidoptera,' 5 vols., 'British Noctua and their Varieties,' 4 vols.; Seitz 'Macro-Lepidoptera,' 130 parts; Morris's 'British Butterflies and Moths,' 5 vols.; South, ditto, 3 vols.; and others. Particulars from—

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

WANTED AT ONCE.—Hundreds of *Lycæna belargus* ♂, *Corydon* ♂, *Euchloe cardamines* ♂, and *Vanessa io* ♂ or ♀. Also a few *Thecla rubi* and *Lyc. arion*. Will give cash or exchange. Can offer Californian or Tropical Butterflies. Dealers or collectors of butterflies in India, Java, Oceania, etc., please send list of showy butterflies.

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

4

THE ENTOMOLOGIST

11

48
204
9

An Illustrated Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

W. G. SHELDON, F.E.S., F.Z.S.

“By mutual confidence and mutual aid
Great deeds are done and great discoveries made.”

VOLUME THE FIFTY-FIFTH.

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

—
1922.

QL 461
E6

PRINTED BY ADLARD AND SON AND WEST NEWMAN, LTD.,
LONDON AND DORKING.

LIST OF CONTRIBUTORS.

- ADKIN, ROBERT, F.E.S., 18, 79, 93, 96,
115, 162, 236
- ALLEN, W. E. R., 163
- ANDERSON, JOSEPH, 256, 277
- ARMSTRONG, B. H., 111
- BAKER, H. W., 137
- BENSON, R. B., 188, 235
- BETTS, E. B. C., 138
- BLACKMAN, T. M., 234
- BLAIR, K. G., B.Sc., F.E.S., 147
- BLENKARN, STANLEY A., 111
- BLISS, ARTHUR, 210, 255
- BOLAM, GEORGE, 139, 234
- BONCK, BARON, 162
- BOND, L. H., 88, 191, 209
- BOORNE, MORRIS, 235
- BOWATER, Capt. W., F.E.S., 237, 255
- BRACKEN, W., B.A., 277
- BRAMWELL, F. G. S., 136, 256
- BROOKE, GILBERT E., M.A., L.R.C.P.,
247
- BROWN, J. A., 236
- BULL, G. V., M.B., 279
- BURKILL, H. J., 23, 118, 259, 264
- CAMPBELL-TAYLOR, J. E., 162, 166
- CAMPION, HERBERT, 71
- CHARTRES, S. A., 20
- CLUTTEN, W. G., 64
- CLUTTERBUCK, C. GRANVILLE, F.E.S.,
155, 189
- COCKERELL, Prof. T.D.A., F.E.S., 17,
49, 67, 135, 176
- COOKE, Lieut.-Colonel, 67
- COULSON, F. J., 163
- CORBET, A. STEVEN, 280
- COX, G. LISSANT, 19
- CRISP, E., 212
- CRUTCHLEY, Rev. G. W., 245
- DAY, F. H., F.E.S., 120
- DRUITT, ALAN, 20
- DUFFIELD, C. A. W., F.E.S., 237
- DURRANT, JNO. HARTLEY, F.E.S., 209
- EDELSTEN, H. McD., 62
- ESSON, L. G., 278
- FASSNIDGE, WM., M.A., 89, 190
- FLETCHER, Prof. T. BAINBRIDGE, R.N.,
F.E.S., 231
- FORD, HAROLD D., 234
- FOX-WILSON, G., 137
- FROHAWK, F. W., F.E.S., M.B.O.U., 136,
280
- GIACOMELLI, E., 225
- GILLETT, Major F., 274, 278
- GIRAULT, A. A., 205
- GOMM, H. G., 233
- GRAY, C. J. V., 212
- GREER, THOMAS, 259
- GRIFFITHS, GEO. C., F.E.S., 39, 111
- GROSVENOR, T. H. L., F.E.S., 162
- HAINES, F. H., M.R.C.S., 17, 40, 84, 104
- HARDS, C. H., 260
- HAYWARD, A. R., 211
- HAYWARD, G. H. SIMPSON, 211
- HAYWARD, Capt. KENNETH, F.E.S., 178,
210
- HAYWARD, H. C., M.A., F.E.S., 188, 258,
278
- HEDGES, ALFRED V., 88,
- HINCHLIFF, Miss, 162
- HODGSON, S. B., 22, 212
- HODSON, W. E. H., 282
- HOLLEYMAN, B. J., 188
- HOLROYD, GEORGE C., 238
- HUNT, H. F., 88
- JACOBS, Major J. J., F.E.S., 210, 238
- JACOBS, STANLEY N. A., 260
- JAQUES, J. M., 38, 137
- JEDDERE-FISHER, H. C., 163
- JONES, A. H., F.E.S., 255
- JONES, HUGH, 42
- JORDAN, Dr. K., F.E.S., 152
- KILLINGTON, FREDK. J., 235
- LANCUM, F. HOWARD, F.L.S., etc., 166
- LITTLEWOOD, FRANK, 90, 260
- LOFTHOUSE, T. ASHTON, F.E.S., 65
- LONG, IAIN D. JEX, 237
- LOWTHER, Dr. RICHARD C., 64, 137, 257,
279
- LUCAS, W. J., B.A., F.E.S., 4, 57, 62,
67, 85, 91, 125, 136, 152, 200, 210,
221, 239
- LYLE, G. T., F.E.S., 281
- MACTAGGART, M., 188, 236
- MALDEN, Rev. P., 187
- MANSBRIDGE, WM., F.E.S., 43, 145
- MATHEW, GERVASE F., Paymaster-in-
Chief R.N., F.L.S., F.E.S., 14, 113,
192
- MELVILL, J. COSMO, M.A., F.E.S., 19
- MERA, A. W., 257
- MEYRICK, EDWARD, B.A., F.R.S., etc.,
16, 255, 270
- MICHELMORE, A. P. G., 162
- MILLER, N. C. E., 213, 282
- MILMAN, P. P., 21
- MILNE, R. M., 136
- MORGAN, E. D., 63
- MORLEY, CLAUDE, F.E.S., F.Z.S., etc., 1
59, 82, 108, 132, 157, 182
- MORRIS, C. E., 36

- MORTON, KENNETH J., F.E.S., 80
 MUIR, INA B., 164
 NAKAHARA, WARO, A.M., Ph.D., 123
 NASH, W. GIFFORD, 90, 238, 278
 NEAVE, S. A., M.A., D.Sc., F.E.S., 116, 214, 240
 NEWSTEAD, ALFRED, F.E.S., 163
 NICHOLSON, C., F.E.S., 88, 91
 NORTON, F., 63
 OLDAKER, F. A., M.A., F.E.S., 127
 OLIVER, G. B., 187, 190
 PEACH, A. H., 237
 PEACOCK, A. D., M.Sc., F.E.S., 227
 PEILE, Lieut.-Colonel H. D., I.M.S., F.E.S., 100
 PIERCE, WALTER, 257
 PIGOTT, Major G. T., 187, 277
 PORRITT, G. T., F.L.S., F.E.S., 279
 POSTANS, A. T., 19, 21, 252, 258, 271
 PROUT, L. B., F.E.S., 144
 RAYNOR, Rev. A. G. S., 22, 234
 RAYWARD, A. L., 162
 RICHARDS, A. W., 67, 234
 RILEY, N. D., F.E.S., F.Z.S., 25, 51, 136, 139, 140, 144, 167, 211, 216, 236, 237, 250, 256, 261, 278, 284
 RIMMER, CHARLES P., 119; 139
 ROTHSCHILD, MIRIAM and ELIZABETH, 258
 ROWLAND-BROWN, H., M.A., F.E.S., 36, 38
 RUSTON, A. HAROLD, 188, 237
 RYLAND, Lieut.-Colonel ALFRED W., F.R.M.S., 204
 SALE, G. HANSON, 37, 39
 SCOTT, E. M. B., 18, 20
 SCOTT, H. H. L., 256
 SHARP, EDWIN P., 20
 SHEDDEN, J. D. W., 257
 SHELDON, W. G., F.E.S., F.Z.S., 30, 48, 53, 72, 73, 95, 112, 116, 123, 131, 161, 166, 179, 194, 221, 241, 265, 282, 288
 SHELLEY, T. J., 187
 SLEATH, J. R., 163, 210
 SOUTH, RICHARD, 43, 44, 91, 211, 265
 SPLOING, ALFRED H., 213
 STAFFORD, AUGUSTUS E., 189, 190
 STANTON, GUY, 111, 210, 238
 STIDSTON, Engr.-Comdr. S. T., R.N., F.E.S., 162, 163
 STOWELL, E. A. C., 233
 SUTTON, G. P., 280
 SYMS, EDGAR E., F.E.S., 239
 TALBOT, G., F.E.S., 188
 TAMS, W. H. T., F.E.S., 196
 TARBAT, Rev. J. E., 65, 236, 256, 257
 THOMPSON, A. H., 68, 166
 THURNALL, A., 189
 TITE, G. E., 136
 TORLESSE, A. D., 187
 TURNER, HY. J., F.E.S., 69, 117, 141, 168, 215, 240, 264
 VICKERS, J. H., 236
 WATSON, DOUGLAS, 88
 WEARE, CHAS., 187
 WESTROPP, DUDLEY, 37
 WHITTLE, F. G., F.E.S., 10
 WILEMAN, A. E., F.E.S., 197
 WILLIAMS, C. B., M.A., F.E.S., 173
 WITHYCOMBE, C. L., F.E.S., B.Sc., 97, 165, 169, 193
 WOOD, F. F., 279
 WOODEFORD, F. C., B.A., F.E.S., 12, 23
 WRIGHT, E., 38, 112
 WYNNE, A. R. F. P., 280
 WYNNE, J. F. G., 70, 118

PLATES.

	FACING PAGE
1. Henry Rowland-Brown	121
2. Coniopterygidæ	169
3. David Sharp	217

FIGURES IN THE TEXT.

	PAGE
Orthetrum cærulescens, Fabr.	6
Diaphora mendica venosa, n.f.	79
Lestes viridis (appendage)	81
Hemerobius stigma, Steph.	97
Blastobasis lignea and ab. adustella	147
Danais chrysippus, ab.	178
Metrioptera brachyptera	202
Conwentzia psociformis (venation)	224
Mosquito wing-spots, Fig. 1	248
" " " 2	249

INDEX.

GENERAL.

- Aberrations of *Agrotis corticea*, 278
 Aberrations of *Colias croceus* and *Agrotis exclamationis*, 259
Acherontia atropos at sea, 278
Acontia luctuosa at sugar, 20
Acrobasis tumidana, Schiff., 112
 Additions to Glamorgan List of Lepidoptera, 63
 A fortnight in Carnarvonshire, 22
 An entomological holiday in S. France, 147
 An uncommon Ant, 281
 An unusual variety of *Chaerocampa elpenor*, 278
 A new *Callimorpha* from N.W. Persia and Armenia, 196
 A new Genus and Species of Microlepidoptera from New Zealand, 270
 A new *Mymarid* from North Wales, 204
 A record capture of Blues, 238
Argynnis lathonia at Gravesend, 88
Aricia medon ab. *albiannulata*, Harr., 260
 Attractiveness of electric light for moths, 89, 90, 138
 A variety of *Cupido minimus*, 212
Blastobasis lignea, Wlsm. (Lep.): A species new to Britain, 145
 Blue spots in *Chrysophanus phlaeas*, 36
Boreus hyemalis, Linn. (Neuroptera), 91
 British Macrolepidoptera in the Hope Department of the Oxford University Museum, Notes on the, 12
 British Neuroptera in 1921, Notes on, 57
 British Odonata in 1920, 4
 British Proctotrypidæ, 1, 59, 82, 89, 108, 132, 157, 182
 Butterflies attracted by human perspiration, 112, 212, 282
 Butterflies of the Vienna district, 65
 Cannibalism among *Cucullia verbasci*, 190, 280
Catocala fraxini in East Kent, 237
Celerio lineata livornica, Esp., in the Isle of Wight, 188
Chrysophanus phlaeas, var., 190
Colias croceus ab. *faillae* in Lines, 277
 ab. *helicina* at Plymouth, 278
Colias croceus, Fourc. (*edusa*), Fab., 7, 211
Colias croceus and *Herse convolvuli* in Surrey, 255
Colias croceus and other Lepidoptera in Cumberland, 233
Colias croceus at Delamere, 166; in Derbyshire, 234; in Sussex, 210; in August at Brighton, 210; in Bucks, Cambridgeshire, Glamorgan, Lincolnshire, Shropshire, Suffolk, Worcestershire, 187; in Cheshire, 163; in Devonshire, 37, 162; in Hunts, 234; in Hants, 235; in Lancashire and Westmorland, 234; in Northumberland, 234; in N. Wales, 255; in Somerset in May, July and August, 210; (*edusa*) in Surrey, 162; in Surrey and N. Cornwall, 210; in Sussex, 162; in Wiltshire, 162; and *Vanessa atalanta* in the Isle of Wight, 162
Colias edusa and *C. electra*: Proportion of pale forms, 88
Colias edusa and some other species at Eastbourne, 17
Colias edusa in South Devon, 37; in Dorset, 18; in Kent, 18
Colias edusa migration in Cannes district, 35
Colias electra and *C. lesbia* (?), 36
 Collecting by powerful lights, 63
 Collecting in 1920 in Gloucestershire, N. Wales, etc., 155
 Colour-preservation in Dragonflies, 209
 Co-ordinated rhythm in Insects: with a record of sound production in an Aphid, 173
 Correction of a generic name, 16
 Correction of nomenclature of Microlepidoptera, 209
 Crickets and refuse dumps, 23
 Curious aberrations of *Danaïs chrysippus*, L., 178
Cydia citrana, Hb., near Wanstead, 188
Danaïs chrysippus, L., ab. *candidata*, Hayward, 212
Daphnis nerii off Scotland, 278

- Deiopeia pulchella* bred from *S. Devon* larva, 137
Deiopeia pulchella and *Sterrhia sacraria* at Lulworth, 20
 Destruction of *Papilio machaon* larvæ by Cuckoos, 280
Diaphora mendica, form *venosa*, n.f., 79
 Dr. Chapman's Library, The sale of, 93

 Earlier stages of *Cacoecia crataegana*, Hubn., On the, 194
 Early and late dates for Lepidoptera, 62
 Early appearance of *Vanessa urticae*, 88
 Early occurrence of *Smerinthus populi*, etc., 111
 Editorial, 73, 244, 265
Emmelesia minorata, etc., at Grassington, 64
Eromene ocella, etc., in Lancashire, 38
Euchloë cardamines in September, 277
Eupithecia trisignaria in Derbyshire and notes from N. Staffs, 237

 Farn Collection of British Lepidoptera, 91, 103
 Flashlight photography and nature, 139
 Food plants of *Callophrys avis* and *Celastrina argiolus*, 38
 Fossil Longicorn Beetle, a new, 176
 Fossil Sawflies of Florissant, Colorado, 49
 Further notes on the Odonata of Constantinople, 80
 Further notes on *Sarrothripus revayana*, 131

 Genus "Amblypodia" Auctorum, 20, 51
 Gynandromorphs, 114

Heliconisa pagenstecheri (Saturnidae), 191
Heliethis armigera in Kent, 188
Hemerobius stigma, Steph. (Neuroptera), 67
 Henri Fabre and the Microgaster, 245, 281
 Herse (*Sphinx*) *convolvuli* at Bedford, 278; at Chichester, 256
 Herse *convolvuli* and *Colias croceus* at Brighton, 256; at Wadhurst, Sussex, 255
 Herse(*Sphinx*)*convolvuli* in Ayrshire 237; in Cambridgeshire, 237; in Hants and the Scilly Isles, 256; in Lincolnshire, 277; in London, 236; in Sussex, 236, 255, 256; in Scotland, 237; in the Isle of Wight, 256
Hippotion celerio in Devonshire, 136
 H. Rowland-Brown: A correction, 161
 Hybridisation in Nature, 190, 213
Hydroecia micacea f. *brunnea* at Seaford, 111
Hyloicus pinastri in Suffolk, 236

Ichneumons attacking cocoons of *Cerura bifida*, 257

 Killing with cyanide, 260, 280

Labidura riparia, Pallas, 238
 Larvæ of *Sphinx convolvuli* in Hants, 19
 Lepidoptera at Lowestoft in August, 258
 Lepidoptera from the neighbourhood of Oundle, 258
 Lepidoptera in East Tyrone, 1922, 258
 Lepidoptera in the Bradfield (Reading) district, 1922, 212
 Lepidoptera in the Swanage district, 189
 Lepidoptera of Glen Fender, Perthshire, and Invershin, Sutherlandshire, 10
 Lepidoptera taken or bred from larvæ and pupæ in Westminster, 22
 Lepidopterous notes for S. Dorset, 86
 Leptogramma *literana* in Yorkshire, 65
Leucania vitellina reared from ova, 69
Libellula depressa, Linn. (Odonata), 67
 Life-cycle of *Penthina soroculana*, Zett., 179
 Life-history of *Hemerobius stigma*, Steph., 97
 Light trap experiments in connection with temperature, 274
Lycaena adonis in Bucks, and an appeal, 186
Lycaena astrarche vars. in N. Lancashire, 111

Manduca atropos in S. Devon, 163
Manduca atropos in Bucks, 235
 Melanic *Eupithecia trisignaria*, 278
 Mosquito diagnosis: A suggestion to describe wing-spots, fork-cells and palp-markings by means of written formulæ, 247

Nemotois minimellus, Z., etc., in Gloucestershire, 189
 Neuroptera in Dorset, 84; the Order, 61
 New Bees from Madeira, 91
 New Chalcid flies from Australia, 205
 New method of preserving specimens, 115
 New name for a fossil fly, 17
 New names for old, 231
 Non-attractiveness of electric light: A query, 64
 Note on Synonymy of two Micro-lepidoptera from British Columbia, 254
 Notes from Alton district, Hants (lep.), 231; from Brockenhurst, 136; from East Kent (Lep.), 233
 Notes on British Odonata in 1920, 4; British Odonata in 1921, 125, 152; British Orthoptera in 1921, 200;

Notes—continued.

- Butterflies from the Bucks Chilterns, 1921, 21; *Colias croceus*, Fourc. (edusa), in Mesopotamia, etc., 100; Lepidoptera from the Chiltern Hills, etc., 1922, 259; Lepidoptera from the New Forest and Swanage, 1922, 211; the Lepidoptera of the Assynt district of Sutherlandshire, 30, 53, 73; the Lepidoptera of Glen Fender, 10; Vanessid larvæ, 14
Nymphs or Naiads, 67

OBITUARY:

- Bacot, Arthur, 120, 142
Burton, R. F. L., 144
Chapman, Thomas Algernon, 44
Distant, William Lucas, 70
Druce, Hamilton, 215
Elwes, H. J., 288
Fruhstorfer, H., 144
Gibb, Lachlan, 95
Horne, Arthur, 261, 288
Newnham, F. B., 216
Purdey, William, 48, 71
Sharp, David, 217
Sloper, G. Orby, 288
Storey, Gilbert, 120
Observations on the biology of Sawflies, 227
On a new species of *Calpe* from Japan, 197
On the identity of *Symphorobius* (*Hemerobius*) *elegans*, Steph., 193
Orrhodia erythrocephala, etc., near Eastbourne, 20

- Pachys betularia doubledayaria* at South Norwood, 211
Parasemidalis annae, Enderlein, a Coniopterygid new to Britain, with notes on some other British Coniopterygidae, 169
Pernoptilota fluviata and other captures in Westmorland, 136
Pernoptilota fluviata in Lancashire and Westmorland, 257
Phryxus livornica at Cardiff, 163
Phryxus livornica larva in Somerset, 211; in Warwick, 163
Pieris rapae, L., in December, 17
Platymischus dilatatus, Westwood, 67
Plusia moneta in Lancashire, 88
Polygonia c-album, etc., in Berkshire, 235; in Bucks, 136, 256; in Herts, 235; in New Forest, 209; in Staffs, and *Heodes phlaeas ab. schmidtii*, 257
Pontia daplidice at Brighton, 188
Present values of the principal works on the Palearctic Lepidoptera, 221, 241, 265
Probable danger of a new pest, 255
Pupal habit of *Telea polyphemus*, 38, 163

- Psithyrus distinctus* in Kent, 166
Pyrameis atalanta in December, 38
Pyrameis atalanta: Immigrants or hibernated specimens, 88
Pyrameis cardui and *Colias croceus* on the Sussex coast, 162
Pyrameis cardui in North Lancashire and Westmorland, 18

Rambles in South-Eastern France, 127

RECENT LITERATURE:

- Insect Transformations, 43
The Lancashire and Cheshire Naturalist, 44
Catalogue of Indian Insects, Part I, 95
The Genitalia of the Tortricidae, 282
The Bulletin of the Hill Museum, 166, 261
Der Insektenkörper und sein Terminologie, 167
Empire Forestry, 167
Natureland, 213
The London Naturalist, 213
Records and Observations of British Lepidoptera during 1921, 213
Annals of Tropical Medicine and Parasitology, 239
Pollination of early Spring Flowers by Moths, 261
Index Animalium: 1801–1850, 139
Report of the Proceedings of the Fourth Entomological Meeting held at Pusa, 139
Seitz' Macrolepidoptera of the World, 284
The Scottish Naturalist, 140, 239
Records from a log-book for 1920, 252, 271
Resting habit of *Pieris rapae*, 67
Retarded emergence of *Mesoleuca albicilata*, 260
Rhopalocera from Rhodes, Samos, Gallipoli, etc., 137
Russian Odonata and Neuroptera, 85
Sale of Dr. Chapman's books: a sequel, 166
Scarcity of *Spilosoma lubricipeda*, 257, 279
Second broods of *Nisoniades tages* and *Cupido minimus*, 19
SOCIETIES:
Carlisle Natural History, 119
Entomological, of London, 23, 68, 116, 140, 167, 214, 239, 285
Entomological, of Hampshire, 285
Lancashire and Cheshire Entomological, 42, 118
London Natural History, 118, 264, 287
Manchester Entomological, 69, 118
South London Entomological, 68, 116, 140, 168, 192, 214, 239, 262, 286

SOCIETIES—*continued*.

- South-West Yorkshire Entomological,
140
Some notes on the habits of male
Tabanidae, 40
Some undescribed Rhopalocera in the
British Museum (Nat. Hist.), 11, 250
Sphinx convolvuli in Cambridgeshire,
Derbyshire, Herts, 188
Spring Lepidoptera in Surrey, 189
Stauropus fagi in Epping Forest, 257
Sterrhia sacraria in Deyon, 237
Sugaring results in 1921 and 1922, 163
Sympetrum scoticum, Don., in Dorset,
39
Synopsis of British Proctotrypidae
(*Oxyura*), 1, 59, 82, 108, 132, 157,
182

Tabanidae, some notes on the habits of
male, 40
Teratological specimen of *Catocala*
nupta, 238
Thalpochares (*Micra*) *parva*, 21
Thanaos tages: second brood, 235
The claw-album in Staffs, etc., 210
The Dipterous family *Blephariceridae*,
135
The Order Neuroptera, 61
The relative attractiveness of various
types of electric light for moths,
165
Third brood of *Pararge megaera* and
Colias edusa in Hants, 19
Trichoptera in Dorset, 104
Trois Lépidoptères nouveaux de la
Rioja, Rép. Argentine, 225
Two gynandromorphs of *Argynnis*
paphia in New Forest, 238
Two new species of Far Eastern
Rhopalocera, 123

Unusual habits, dates, and occurrences
for Lepidoptera, 86
Unusual occurrence of *Pieris rapae*, 111

Vanessa antiopa in Gloucestershire,
111; in Surrey, 136

Vanessa c-album in Bucks, 136; in New
Forest, 209
VARIETIES:
Aglais urticae, 92
Agrotis corticea abs., 278
Aphantopus hyperanthus, 92
Argynnis adippe, 92
Argynnis aglaia, 92, 168
Argynnis paphia, 238
Aricia medon, 260
Boarmia repandata, 43
Brenthis euphrosyne, 92, 190
Catocala nupta, 238
Chaerocampa elpenor, 278
Chrysophanus phlaeas, 190
Cupido minimus, 212
Diaphora mendica, 258
Dryas paphia, 92
Epinephele ianira, 92
Epinephele tithonus, 93
Euchlœ cardamines, 69, 92, 258
Eupithecia trisignaria, 278
Limenitis sibylla, 92
Lycæna aegon, 42
Melanargia galatea, 92
Melitæa athalia, 233
Melitæa aurinia, 69
Nemeophila russula, 43
Pararge megaera, 69
Pieris brassicae, 259
Pieris napi, 35
Polygonia c-album, 92
Polyommatus icarus, 69
Pyrameis atalanta, 92
Pyrameis cardui, 92
Thecla w-album, 190
Triphaena fimbria, 43
Vanessa io, 42
Vanessa io, ab. *belisaria*, 136
Vitality of *Brenthis euphrosyne*, 39

Wicken Fen Fund, 116
Wing venation of the *Coniopterygidae*,
224

Zoological Record, 115
Zygaenidae attracted by *Lasiocampa*
quercus ♀, 280

SPECIAL INDEX, 1922.

New Genera, Species, Subspecies and Varieties are marked with an asterisk.

Order VII. ORTHOPTERA.

- Acridium, 95
Acrydium, 95
aegyptium (Acridium), 149
albicincta (Ectobia), 149
auricularia (Forficula), 200, 239
auricularia, var. forcipata (Forficula), 137, 200
bicolor (Stauroderus), 203
bimaculatus (Gryllus), 201
bipunctatus (Tetrix = Acrydium), 95, 202
brachyptera (Metrioptera), 202
burdigalensis (Gryllus), 149
campestris (Gryllus), 149, 201
decipiens (Forficula), 148
decipiens (Loboptera), 149
desertus (Gryllus), 149
domesticus (Gryllus), 23 (presumably), 201
egena (Empusa), 149, 263
gallicus (Bacillus), 149
germanica (Oedipoda), 263
griseoaptera (Pholidoptera), 201
grossus (Mecostethus), 203
gryllotalpa (Gryllotalpa), 149
lapponicus (Ectobius), 200
maculatus (Gomphocerus), 203
moesta (Anisolabis), 148
morosus (Carausius), 140
morusus (Baurosus), 192
orientalis (Blatta), 200
parallelus (Chorthippus), 203
pauperata (Empusa), 141
perspicillaris (Ectobius), 200
pubescens (Forficula), 148, 203
punctatissima (Leptophyes), 201
religiosa (Mantis), 149, 263
riparia (Labidura), 238, 262
rufipes (Omocestus), 203
stridulus (Psophus), 263
subulatus (Tetrix), 202
sylvestris (Nemobius), 201
viridissima (Phasgonura), 201
viridulus (Omocestus), 203
vittiventris (Ectobia), 149

Order XII. EPHEMEROPTERA.

- danica (Ephemera), 9

Order XIII. PARANEUROPTERA. [= Odonata.]

- aenea (Cordulia), 7, 126, 153, 154
albistylum (Orthetrum), 85
anceps (Orthetrum), 80, 82
annulatus (Cordulegaster), 7, 125, 153
barbarus (Lestes), 81, 85, 150
brunneum (Orthetrum), 85
caerulescens (Orthetrum), 4, 5, 6, 125, 126, 153, 154
cancellatum (Orthetrum), 4, 82
cyanea (Aeschna), 7, 125, 152, 153
cyathigerum (Enallagma), 4, 10, 86, 127, 153, 154
depressa (Libellula), 4, 67, 125, 153, 154
dubia (Leucorrhinia), 4, 153
elegans (Ischnura), 9, 125, 126, 152, 153
erythrea (Crocothemis), 150
flaveolum (Sympetrum), 4, 85
flavomaculata (Somatochlora), 80, 82
fonscolombi (Sympetrum), 80, 82
fonscolombii (Sympetrum), 152, 153
forcipatus (Onychogomphus), 82
fusca (Sympycna), 85, 150
grandis (Aeschna), 8, 125, 152
haemorrhoidalis (Calopteryx), 150
hafniense (Brachytron), 150
imperator (Anax), 126, 153, 154
juncea (Aeschna), 7
lindeni (Cercion), 80, 82
macrostigma (Lestes), 81
mercuriale (Agrion), 9, 127, 150, 153, 154
meridionale (Sympetrum), 80, 82
metallica (Somatochlora), 82

- mixta* (Aeschna), 7, 80, 82, 150
naias (Erythromma), 86, 153
nymphula (Pyrrhosoma), 4, 9, 80, 82, 125, 127, 150, 152, 153, 154
nymphula, var. *melanotum* (Pyrrhosoma), 152
pennipes (Platynemesis), 9, 82, 126
pennipes, var. *lactea* (Platynemesis), 9, 82
pratense (Brachytron), 7, 125, 153
puella (Agrion), 9, 125, 127, 150, 153, 154
pulchellum (Agrion), 9, 86, 153
pumilio (Ischnura), 9, 85, 127
quadrifasciata (Libellula), 4, 85, 125, 126, 154
sanguineum (Sympetrum), 126
scoticum (Sympetrum), 4, 39, 126, 154
splendens (Calopteryx), 9, 153
sponsa (Lestes), 9, 126, 154
striolatum (Sympetrum), 4, 126, 150, 153
tenellum (Pyrrhosoma), 9, 127, 154
tenellum, var. *melanogastrum* (Pyrrhosoma), 9, 127
virens (Lestes), 80, 81
virgo (Calopteryx), 8, 125, 126, 153, 154
virgo, var. *anceps* (Calopteryx), 153
virgo festiva (Calopteryx), 80
viridis (Lestes), 80, 81
vulgatissimus (Gomphus), 7, 125

Order XV. HEMIPTERA.

- coffeae* (Toxoptera), 175
culiciformis (Ploiariola), 119
lanigera (Schizoneura), 69
lateralis (Philaenus), 120
leucocephala (Philaenus), 120
leucophthalma (Philaenus), 120
lateralis (Philaenus), 120
lineata (Philaenus), 120
luridus (Strongylocoris), 119
marginellus (Philaenus), 120
niveus (Oecanthus), 174
pilosus (Bothynotus), 119
populi (Philaenus), 120
spumarius (Philaenus), 120
vittata (Philaenus), 120

Order XVI. NEUROPTERA (including MEGALOPTERA and MECOPTERA).

- abbreviata* (Chrysopa), 84
alba (Chrysopa), 84
aleurodifformis (Semidalis), 58, 171, 172
angulatus (Micromus), 84
annae (Parasemidalis), 169, 170, 171, 172
atrifrons (Hemerobius), 84
beckwithii (Hemerobius), 194
bipennis (Nemoptera), 263
capitata (Nothochrysa), 58, 85
Chrysopa, 98
chrysops (Osmylus), 57, 84
coa (Nemoptera), 263
cognata (Raphidia), 84
communis (Panorpa), 58, 85
concinus (Hemerobius), 58, 84
Coniopterygidae, 169, 224
Coniopteryx, 141
cryptoneuris (Conwentzia), 171
curtisiana (Semidalis), 171, 172
dalii (Sisyra), 84
dorsalis (Chrysopa), 165
elegans (Sympherobius), 193, 194
flava (Chrysopa), 84
flavifrons (Chrysopa), 84
formicarius (Myrmeleon), 150
fuliginosa (Sialis), 57, 84, 151
fuscata (Sisyra), 84
fuscipennis (Parasemidalis), 169, 170, 171, 172
germanica (Panorpa), 58, 85
Hemerobius, 98, 287
humuli (Hemerobius), 84, 99
hyemalis (Boreus), 91
lactea (Coniopteryx), 85
libelluloides (Ascalaphus), 150
libelluloides (Palpares), 150, 240, 263
longicornis (Ascalaphus), 150
lutaria (Sialis), 57, 84
lutea (Helicoconis), 172
lutescens (Hemerobius), 84, 99
maculicollis (Raphidia), 84, 287
marginatus (Hemerobius), 84
marshami (Hemerobius), 194
micans (Hemerobius), 57, 84
nervosus (Hemerobius), 84
nitidulus (Hemerobius), 84
notata (Raphidia), 84, 287
paganus (Micromus), 84
pellucidus (Hemerobius), 84
perla (Chrysopa), 58, 85, 287
phyllochroa (Hemerobius), 85
pineticola (Conwentzia), 171, 172
pineticola, var. *tetensis* (Conwentzia), 171
pini (Hemerobius), 84
prasina (= *aspera*) (Chrysopa), 58, 84, 151, 168
psociformis (Coniopteryx), 85
psociformis (Conwentzia), 171, 172, 224
pygmaea (Coniopteryx), 169, 170, 171, 172

pygmaeus (*Symphorobius*), 194
 quadrifasciatus (*Hemerobius*), 84
Semidalis, 224
sinuata (*Nemoptera*), 263
stigma (*Hemerobius*), 57, 58, 67, 84, 97,
 99
striatellus (*Symphorobius*), 193, 194
subnebulosus (*Hemerobius*), 84
tenella (*Chrysopa*), 58, 84

tetragrammicus (*Formicaleo*), 86
tineiformis (*Coniopteryx*), 171, 172
trigrammus (*Myrmecaelurus*), 86
variegatus (*Micromus*), 84
ventralis (*Chrysopa*), 84
vittata (*Chrysopa*), 84
vulgaris (*Chrysopa*), 58, 84, 151, 168
vulgaris, state *carnea* (*Chrysopa*), 84
xanthostigma (*Raphidia*), 84

Order XVII. TRICHOPTERA.

affinis (*Limnophilus*), 104
albicorne (*Odontocerus*), 106
albifrons (*Leptocerus*), 106
angustata (*Molanna*), 106
angustella (*Orthotrichia*), 106
angustipennis (*Hydropsyche*), 107
annulatus (*Drusus*), 105
articularis (*Beraea*), 106
aterrimus (*Leptocerus*), 106
atomarius (*Grammotaulius*), 107
auricula (*Limnophilus*), 104
azurea (*Mystacides*), 106
bicolor (*Triaenodes*), 106
bilineatus (*Leptocerus*), 107
bipunctatus (*Limnophilus*), 106
centralis (*Limnophilus*), 104
ciliaris (*Notidobia*), 105
cinereus (*Leptocerus*), 106
comatus (*Agapetus*), 107
conspersa (*Plectrocnemia*), 107
conspersa (*Triaenodes*), 106
costalis (*Oxyethira*), 106
digitatus (*Halesus*), 105
dissimilis (*Leptocerus*), 106
dorsalis (*Rhyacophila*), 107
dubius (*Holocentropus*), 107
elegans (*Limnophilus*), 104
falcata (*Oxyethira*), 106
femoralis (*Hydroptila*), 108
flavomaculatus (*Polycentropus*), 107
forcipata (*Hydroptila*), 106
fulvipes (*Hydropsyche*), 107
fuscipes (*Agapetus*), 107
grandis (*Phryganea*), 104
griseus (*Limnophilus*), 104
guttata (*Hydropsyche*), 107
hirtum (*Lepidostoma*), 105
incisus (*Colpotaulius*), 104
lateralis (*Micropterna*), 105
latipennis (*Stenophylax*), 105
lepida (*Hydropsyche*), 107
longicornis (*Mystacides*), 106
lunatus (*Limnophilus*), 104
luridus (*Limnophilus*), 105

machlachlani (*Hydroptila*), 106
marginata (*Chimarra*), 107
marmoratus (*Limnophilus*), 104
maurus (*Beraea*), 106
minor (*Phryganea*), 107
minuta (*Beraeodes*), 106
muliebris (*Apatania*), 108
multiguttatus (*Polycentropus*), 107
multipunctata (*Agraylea*), 108
nervosa (*Anabolia*), 105
nigra (*Mystacides*), 107, 108
nigricornis (*Silo*), 105
ochracea (*Oecetis*), 106
pallipes (*Silo*), 107, 108
pellucidula (*Hydropsyche*), 106
pellucidus (*Glyphotaelius*), 104
permistus (*Stenophylax*), 105, 106, 108
personatum (*Sericostoma*), 105
phaeopa (*Lype*), 107
pivicornis (*Holocentropus*), 107
pilosa (*Goera*), 105
pullata (*Beraea*), 106
pusilla (*Psychomyia*), 107
radiatus (*Halesus*), 105
reducta (*Adicella*), 106
rhombicus (*Limnophilus*), 104, 105
Rhyacophila, 107
ruficus (*Neuronia*), 108
sequax (*Micropterna*), 108
sparsa (*Hydroptila*), 106, 108
sparsus (*Limnophilus*), 104
stellatus (*Stenophylax*), 105
striata (*Phryganea*), 104
subnigra (*Wormaldia*), 107
subnubilus (*Brachycentrus*), 105
testacea (*Oecetis*), 106
tineoides (*Hydroptila*), 107
trimaculatus (*Cyrnus*), 104
tristella (*Oxyethira*), 106
varia (*Phryganea*), 104
villosa (*Chaetopteryx*), 105, 107
vittatus (*Limnophilus*), 107, 108
waeneri (*Tinodes*), 107

Order XVIII. LEPIDOPTERA.

abbreviata (*Eupithecia*), 253
abruptaria (*Hemerophila*), 22, 118, 141
achilleae (*Zygaena*), 13, 96
actaeon (*Adopaea*), 138, 189, 212

actaeon (*Thymelicus*), 130
Actias, 39
adippe (*Argynnis*), 92, 130
adonis (*Lycaena*), 186, 189

- adoratrix (Colias), 35
 adusta (Eumichtis), 55, 272
 adustata (Ligdia), 233, 279
 adustella (Blastobasis), 38, 119, 147
 advenaria (Epione), 271
 advenella (Rhodophaea), 258
 aegon (Plebeius), 42, 46, 65, 114, 211
 aethiops (Erebia), 64, 66, 113, 118
 affinis (Calymnia), 22
 affinitata (Perizoma), 137
 aglaia (Argynnis), 22, 53, 92, 119, 130, 211
 albiannulata (Aricia), 260
 albiannulata (Lycaena), 112
 albicillata (Mesoleuca), 260
 albicosta (Coleophora), 78
 albigula (Dianthoecia), 115
 albipunctata (Eupithecia), 254, 278
 albitriana (Peronea), 76
 albulalis (Nola), 114
 albulata (Perizoma), 64, 73
 alceae (Carcharodus), 130, 138
 alcetas (Everes), 46
 alchemillata (Perizoma), 73
 alchimiella (Gracillaria), 156
 alcon (Lycaena), 46
 aleyone (Satyrus), 131
 algae (Bryophila), 44
 allous (Lycaena), 112
 alnifoliella (Lithocolletis), 156
 alopecurus (Xylophasia), 55
 alpinellus (Crambus), 258
 alternata (Xanthorhoe), 63
 altheae (Carcharodus), 130
 alveus (Hesperia), 130
 amandus (Polyommatus), 138
 ambigua (Caradrina), 63
 ambigualis (Scoparia), 75, 156
 Amblypodia, 25
 amethystina (Polyommatus), 66
 anchisiades (Papilio), 113
 *andamanica (Horsfieldia), 28
 andreniformis (Sesia), 14, 118
 angelicata (Eupithecia), 278
 angellicella (Depressaria), 63
 angularia (Cleora), 115
 angustana (Eupoecilia), 78
 angustana (Steganoptycha), 77
 angustea (Scoparia), 75
 anita (Horsfieldia), 25
 anna (Horsfieldia), 52
 annetta (Horsfieldia), 26, 51
 anomala (Stilbia), 23
 anthemidana (Eupoecilia), 258
 antifaunus (Hypolycaena), 282
 antimachus (Pseudaletis), 251
 antiopa (Euvanessa), 72, 92, 111, 118, 129, 136
 antiqua (Orgyia), 22
 apiciaria (Epione), 75
 apicipunctella (Elachista), 78
 apidanus (Amblypodia), 25
 applana (Depressaria), 78
 aquilana (Peronea), 76
 Arbela, 231
 arbutella (Euchromia), 77
 arbutella (Eucosma), 11
 arcua (Polyommatus), 66
 arcuella (Eucosma), 156
 arenaria (Cleora), 12
 areola (Xylocampa), 253
 arethusa (Hipparchia), 131
 argiades (Everes), 46, 66, 130, 148
 argiolus (Celastrina), 22, 38, 114
 argiolus (Cyaniris), 86, 136, 138, 189, 232, 238
 argus (Plebeius), 46, 116, 118, 130, 138
 Arhopala, 25
 arion (Lycaena), 46, 96, 114, 155, 189, 211
 armigera (Heliothis), 188
 arracana (Horsfieldia), 27
 ashworthii (Agrotis), 70
 aspersana (Peronea), 76
 assimilis (Crymodes), 55
 asteris (Cucullia), 155
 astrarche (Lycaena), 111, 138, 189, 238
 atalanta (Pyrameis), 16, 17, 21, 22, 24, 38, 53, 63, 66, 88, 92, 119, 130, 136, 137, 141, 162, 189, 258
 athalia (Melitaea), 66, 92, 130, 233
 atomalis (Scoparia), 75
 atomaria (Ematurga), 13, 66, 75, 254
 atra (Acanthopsyche), 10
 atrata (Odezia), 56, 283
 atropos (Acherontia), 163, 278
 atropos (Manduca), 235, 258
 Attacus, 39
 aubuissoni (Colias), 103
 augur (Noctua), 55
 aurago (X.), 64
 aurantiaria (Hybernia), 141
 aureatella (Eriocephala), 11
 aurinia (Melitaea), 69, 117, 148, 257, 258, 259
 autumnana (Peronea), 76
 autumnaria (E.), 64
 avis (Callophrys), 38, 46
 *axantha (Danais), 178
 baia (Noctua), 119
 barrettii (Dianthoecia), 22, 23, 115
 basilinea (Apamea), 272
 *batjana (Horsfieldia), 51
 baton (Lycaena), 130
 baumanniana (Argyrolepis), 78
 bavius (Polyommatus), 138
 beatricella (Lozopera), 72
 belisaria (Vanessa), 136
 bellargus (Argiades), 54, 65, 66, 114, 130, 211, 235, 238, 257
 bertrami (Platyptilia), 188
 betulae (Ornix), 78
 betulae (Salebria), 76
 betulae (Zephyrus), 42, 155, 271
 betularia (Amphidasys), 69, 211

- betularia* (Biston), 12
betularia (Pachys), 75
biarcuana (Ancyli), 77
bicolor (Notodonta), 114
bicostella (Pleurota), 78
bidentata (Gonodontis), 12, 90
bifida (Cerura), 258
bifida (Dicranura), 257
bilineata (Camptogramma), 73, 141
bilunaria (Selenia), 22, 62, 75, 119
bimaculata (Bapta), 63, 254
binaria (Drepana), 258
bipunctaria (Ortholitha), 65
bipunctidactyla (Stenoptila), 76
birdella (Ochsenheimeria), 156
biselliella (Tineola), 78
bistortata (Ectropis), 13
bistrigella (Phylloporia), 78
biundularia (Ectropis), 13
boeticus (Lampides), 114, 130, 138
brassicæ (Barathra), 22
brassicæ (Pieris), 18, 22, 34, 36, 91, 117,
 130, 137, 188, 234, 245, 259, 280, 281
briseis (Hipparchia), 131
briseis (Satyrus), 66, 138
brockeella (Argyresthia), 78
brumata (Cheimatobia), 56, 64
brunnea (Hydraecia), 111
brunnea (Noctua), 55, 211
brunnea (Xylophasia), 55
brunneata (Itame), 13
bryoniae (Pieris), 33, 34
bucephala (Phalera), 22
byringerana (Peronea), 76
caerulea (Polyommatus), 22, 66
caeruleopunctata (Chrysophanus), 190
caesiata (Entephria), 56
caesiata (Larentia), 42
caespititiella (Coleophora), 78
caia (Arctia), 114, 141, 253
c-album (Polygonia), 24, 66, 92, 118,
 131, 136, 140, 209, 212, 235, 256,
 258
Callosamia, 39
callunae (Lasiocampa), 54, 87
callunaria (Eupithecia), 74
cambrica (Venusia), 56
cambricaria (Venusia), 42
camilla (Limenitis), 129, 137
cana (Catoptria), 78
cana (Miana), 55
candidata (Asthenia), 87
**candidata* (Danais), 179, 212
candrena (Catagramma), 113
capsincola (Dianthoecia), 232
capucina (Peronea), 76
carbonana (Argyrolepis), 284
cardamines (Euchloë), 69, 92, 117, 119,
 141, 148, 189, 238, 258, 277
cardui (Pyrameis), 17, 18, 21, 22, 42,
 53, 66, 92, 119, 130, 137, 138, 162,
 189, 232, 271
carmelita (Odontesia), 234
carniolica (Zygaena), 65
carphodactyla (Hellensia), 72
carpinata (Lobophora), 10, 253, 279
carphophaga (Dianthoecia), 232, 272
cassiope (Erebia), 131
casta (Fumea), 11
castesti (Argynnis), 24
castigata (Eupithecia), 74
caudana (Rhaeodia), 63, 76
caulosticta (Euchloë), 258
celerio (Hippotion), 136
centonalis (Nola), 114
centumnotata (Cidaria), 43, 56
ceronus (Agriades), 66
cervinaria (Ortholitha), 272
cespitana (Sericoris), 34, 77, 156
chaonia (Notodonta), 90
charlotta (Argynnis), 92
charlottana (Peronea), 72
chi (Polia), 56
chrysippus (Danais), 178
chrysonuchellus (Crambus), 155
chrysotheme (Colias), 36, 66,
chrysothemiformis (Colias), 36
ciliella (Eupoecilia), 78
cinerea (Agrotis), 258, 271
cinxia (Melitaea), 92, 130
circe (Satyrus), 131, 137
citrana (Cydia), 188
citrata (Cidaria), 68
cladiella (Glyphipteryx), 78
clathrata (Chiasmia), 13, 66
clathrata (Strenia), 42
cleopatra (Gonepteryx), 128, 137
cloacella (Scardia), 78
elytie (Apatura), 66
c-nigrum (Noctua), 23, 55, 272, 280
coenosa (Laelia), 114
cognata (Thera), 11, 56
cognatana (Laspeyresia), 11
combustana (Peronea), 76
comes (Triphaena), 22, 23, 55, 119
comma (Augiades), 66
comma (Pamphila), 259
comma-notata (Cidaria), 43
complana (Lithosia), 88, 258
compositella (Stigmonota), 78
concinata (Cidaria), 68
concinata (Larentia), 141
conformis (Xylina), 115
**confusa* (Horsfieldia), 51
congelatella (Exapate), 157
conigera (Leucania), 233
conjugella (Argyresthia), 78
consociella (Rhodophaea), 258
consonaria (Ectropis), 13
consonaria (Tephrosia), 141, 254
consortaria (Boarmia), 13
conspersa (Dianthoecia), 232
conspersana (Tortrix), 156
contaminellus (Crambus), 258
conversaria (Boarmia), 12
convolvuli (Herse), 236, 255, 277, 280

- convolvuli (Sphinx), 19, 66, 188, 233, 236
 coracina (Psodos), 66
 coretas (Everes), 130, 148
 corticea (Agrotis), 273, 278
 corydon (Agriades), 22, 65, 114, 130, 190, 235, 238, 256, 259
 corylaria (Angerona), 12
 corylata (Cidaria), 56, 254
 coryli (Demas), 63, 90, 232
 Cosmophorana, 11
 costaestrigalis (Hypenodes), 23, 88
 costosa (Depressaria), 254
 crabroniformis (Trochilium), 232
 crataegana (Cacoecia), 194
 crataegi (Aporia), 92, 137
 crataegi (Trichiura), 54
 crepuscularia (Ectropis), 13
 cribrum (Coscinia), 88
 cristana (Peronea), 72, 76
 crocealis (Ebulia), 42
 croceus (Colias), 100, 122, 162, 166, 187, 210, 232, 233, 235, 238, 255, 258, 259, 277, 280
 cucubali (Dianthoecia), 232, 272
 culmellus (Crambus), 76
 curtisana (Peronea), 72
 cydippe (Argynnis), 211
 cyllaris (Lycaena), 148
 cytherea (Adelpha), 113
 damon (Lycaena), 65
 daplidice (Pontia), 36, 66, 91, 128, 137, 188
 darana (Horsfieldia), 27
 *dardanella (Pseudaletis), 251
 dardanus (Papilio), 24
 defoliaria (Hybernaria), 22
 degenerana (Sarothripus), 132
 degreyana (Eupoecilia), 258
 delamerensis (Ectropis), 13
 dentina (Mamestra), 271, 272
 designata (Coremia), 56
 dia (Argynnis), 66
 dictaeoides (Pheosia), 258
 didyma (Melitaea), 130, 137
 didymata (Malenydris), 56
 diluta (Asphalia), 42
 dimidiana (Penthina), 76
 dimidiata (Acidalia), 87
 dina (Horsfieldia), 27
 dispar (Chrysophanus), 113
 dispar (Heodes), 44
 dispila (Euchloë), 258
 distinctana (Coccyx), 76
 ditrapezium (Noctua), 119
 divisana (Peronea), 76
 dolabraria (Eurymene), 90
 dominula (Callimorpha), 114
 dorilis (Heodes), 65, 130
 *dorothea (Eurema), 123
 doubledayaria (Amphidasys), 12, 69, 211
 dromedarius (Notodonta), 54
 dryas (Satyrus), 65, 131
 dryodoxana (Depressaria), 254
 duplaris (Palimpsestis), 54, 63
 duponchelii (Leptidea), 148
 eberalda (Horsfieldia), 52
 edusa (Colias), 17, 18, 19, 22, 35, 36, 37, 63, 66, 88, 92, 100, 122, 128, 137, 162, 189, 280
 egea (Polygonia), 137
 egeria (Pararge), 21, 63, 65, 131, 136, 189, 259
 egerides (Pararge), 21, 259
 *elapsa (Peronea), 255
 electra (Colias), 36, 88
 elga (Horsfieldia), 52
 elinguaris (Gonodontis), 156
 elongella (Gracilaria), 78
 elpenor (Chaerocampa), 278
 Emutaria, 188
 epiphron (Erebia), 42, 119, 131
 ericellus (Crambus), 76
 ericetana (Orthotaenia), 77
 ericetella (Gelechia), 78
 erichsoni (Horsfieldia), 29
 eros (Polyommatus), 46
 erosaria (Eugonia), 258
 erythrocephala (Cerastis), 115
 erythrocephala (Orrhodia), 20
 escheri (Agriades), 46
 escheri (Polyommatus), 130
 euphemus (Lycaena), 46
 euphenoides (Euchloë), 148
 euphorbiae (Acronycta), 54
 euphorbiana (Eudemita), 72
 euphrosyne (Brenthis), 21, 39, 42, 69, 92, 189, 190, 271, 272
 exanthemata (Cabera), 74
 exclamatonis (Agrotis), 22; 119, 163, 259, 273
 exigua (Caradrina), 88
 extinctaria (Phigalia), 12
 exulans (Zygaena), 96
 exulis (Crymodes), 55, 114
 fabiana (Horsfieldia), 52
 fabriciana (Simaethis), 78
 fagara (Scodiona), 75
 fagi (Stauropus), 64, 257
 faillae (Colias), 103, 277
 faisina (Horsfieldia), 28
 fara (Horsfieldia), 28
 farinatella (Cedestis), 155
 fascelina (Dasychira), 118
 fasciuncula (Miana), 55
 feisthameli (Papilio), 128
 ferrugana (Peronea), 63, 76
 ferrugata (Coremia), 56
 festaliella (Chrysocoris), 76
 festiva (Noctua), 55
 fibrosa (Apamea), 43
 fidia (Satyrus), 131
 fieldii (Colias), 100
 filipendulae (Zygaena), 13, 18, 34, 65, 75, 156, 280

- fimbria (Triphaena), 43
 flammealis (Endotricha), 156
 flava (Adopaea), 138
 flava (Zygaena), 13
 flavicinctata (Entephria), 57
 flavicinctata (Larentia), 64
 flavicornis (Asphalia), 42
 flavicornis (Polyplocia), 54
 flavo-rufa (Xylophasia), 55
 flavus (Thymelicus), 130
 fluctuata (Xanthorhoë), 22, 57
 fluviata (Pernoptilota), 136, 257
 forficalis (Botys), 75
 forficalis (Pionea), 21
 formiciformis (Sesia), 87, 88
 fowleri (Agriades), 114
 fractifasciana (Cydia), 11
 fragariana (Torticodes), 255
 fraxini (Catocala), 115, 232, 237
 frequentella (Scoparia), 75
 fritillum (Hesperia), 130
 fuciformis (Hemaris), 189
 fuliginosa (Phragmatobia), 119, 183
 fuliginosa (Spilosoma), 63
 fulvaria (Itame), 13
 fulvata (Cidaria), 56
 fumata (Acidalia), 56
 Fumea, 11
 *fumosa (Tolype), 226
 furcata (Hydriomena), 73
 furcifera (Xylina), 115
 furcula (Cerura), 54
 fusca (Salebria), 76
 fuscalis (Botys), 75
 fusconebulosa (Hepialus), 75
 fusco-undata (Hydriomena), 73
 fusiformis (Hemaris), 271
 gachtaria (Ortholitha), 65
 galatea (Melanargia), 21, 65, 92, 131,
 189, 211, 222, 235, 259
 galiata (Plemyra), 156
 galiata (Xanthorhoë), 57, 273
 galii (Deilephila), 69
 gallicus (Hepialus), 75
 gamma (Plusia), 18, 22, 56, 65, 87
 genistae (Mamestra), 271
 glabra (Orrhodia), 20
 glareosa (Noctua), 23
 glaucata (Cilix), 137
 glyphica (Euclidia), 65, 115, 271
 goedartella (Argyresthia), 78
 gonerilla (Pyrameis), 16
 gothica (Taeniocampa), 56, 119, 253
 graafi (Lycaena), 111
 gracilis (Taeniocampa), 56, 117, 253
 griseana (Tortrix), 209
 grisella (Achraea), 38
 griseola (Lithosia), 63
 *grisescens (Phalonia), 209
 grossulariata (Abraxas), 12, 22, 34, 74,
 115, 118, 141
 grotiana (Dichelia), 258
 gueneii (Luperina), 118
 hainana (Horsfieldia), 28
 hamana (Argyrolepis), 78
 harpagula (Drepana), 114
 hastata (Eulype), 73, 210, 254, 271
 hastiana (Peronea), 33, 63, 73, 76
 haworthiata (Eupithecia), 272
 hebudium (Eupithecia), 74
 hecabe (Eurema), 123
 helice (Colias), 35, 37, 66, 88, 101, 137
 162, 210, 233, 256, 259, 277, 280
 helicina (Colias), 35, 103
 hepariella (Zelleria), 10
 hepatica (Xylophasia), 273
 hera (Callimorpha), 65, 128
 herbosana (Dicrorampha), 78
 hermes (Erystychia), 113
 herminata (Diplodoma), 78
 hermione (Satyrus), 66, 129, 137
 hesperidis (Euchloë), 216, 238
 hetaera (Teracolus), 69
 hexapterata, 88
 hibernica (Camptogramma), 73
 hippocastanaria (Pachycnemis), 87
 hirtaria (Lycia), 22, 254
 hispidaria (Apocheima), 253
 hispidus (Heliophobus), 69
 hispula (Epinephele), 33, 54, 131
 *hokkaida (Calpe), 198
 *Horsfieldia, 25
 huebnerella (Chelaria), 78
 humuli (Hepialus), 75
 hyale (Colias), 18, 65, 66, 92, 129, 233,
 280
 hylas (Lycaena), 66
 hyperanthus (Aphantopus), 92, 211
 hyperbius (Argynnis), 24
 hyrax (Adopaea), 137
 ianira (Epinephele), 92
 icarinus (Polyommatus), 69, 117, 130
 icarus (Polyommatus), 21, 22, 46, 54,
 65, 69, 114, 117, 130, 138, 156, 189,
 211, 238, 259
 ictericana (Cnephasia), 284
 ida (Epinephele), 131
 ilia (Apatura), 66
 ilicis (Thecla), 138
 ilione (Ituna), 113
 illuminata (Argyresthia), 155
 immanata (Cidaria), 56, 115
 immundata (Eupithecia), 74
 impluviata (Hydriomena), 73
 incerta (Taeniocampa), 117, 253
 incertana (Cnephasia), 284
 *Indarbela, 231
 infuscata (Hydriomena), 73
 inopiana (Ephippiphora), 63
 *insulicola (Nacoleia), 231
 intermedia (Bombycia), 55
 interrogationis (Plusia), 56
 invirae (Opsiphanes), 113
 io (Vanessa), 14, 21, 42, 66, 92, 131, 136,
 156, 253, 271
 iole (Apatura), 66

- iphiclea (*Adelpha*), 24
 iphis (*Coenonympha*), 65
 iris (*Apatura*), 66, 92, 128
 irrorella (*Semta*), 114
 isis (*Coenonympha*), 69
 itea (*Pyrameis*), 16
 jacobaeae (*Euchelia*), 233, 258
 jasius (*Charaxes*), 128
 julia (*Colaenis*), 113
 juliaria (*Ennomos*), 22
 juniperata (*Thera*), 11
 jurtina (*Epinephele*), 18, 33, 53, 66, 131, 138, 273
 kilmunella (*Elachista*), 78
 lacertinaria (*Drepana*), 54
 lacteella (*Endrosis*), 78
 lacticolor (*Abraaxas*), 12
 lacunana (*Sericoris*), 77
 lambda (*Xylina*), 115
 Lamprosema, 231
 lanceolana (*Bactra*), 77
 lanestris (*Eriogaster*), 69
 lapponaria (*Poecilopsis*), 12
 lariciata (*Eupithecia*), 74
 laripennella (*Coleophora*), 78
 larissa (*Melanargia*), 138
 lathonia (*Issoria*), 66, 72, 88, 92, 128, 137
 latistrius (*Crambus*), 258
 laurentia (*Apatura*), 113
 lavaterae (*Hesperia*), 130
 lenea (*Dircenna*), 24
 lestia (*Colias*), 36
 lethe (*Hypanartia*), 113
 leucographa (*Pachnobia*), 63
 leucophaearia (*Hybernia*), 141, 253
 levana (*Araschnia*), 66, 92
 libatrix (*Scoliopteryx*), 273
 libythea (*Eurema*), 124
 lichenea (*Aporophyla*), 23
 ligea (*Erebia*), 53
 lignea (*Blastobasis*), 38, 69, 119, 145
 ligures (*Lycaenesthes*), 282
 ligustri (*Sphinx*), 273
 limbaria (*Isturgia*), 13
 limitata (*Ortholitha*), 56, 65
 linariata (*Eupithecia*), 63
 linea (*Hesperia*), 190
 linearia (*Ephyra*), 118
 literana (*Leptogramma*), 65
 lithargyria (*Leucania*), 119
 lithoxylea (*Xylophasia*), 55
 littoralis (*Leucania*), 23, 118
 littoralis (*Sericoris*), 34, 76
 liturata (*Macaria*), 12
 liturata (*Semiothisa*), 75
 liturella (*Depressaria*), 78
 livornica (*Deilephila*), 155
 livornica (*Phryxus*), 114, 163, 188, 211
 logiana (*Peronea*), 63
 lota (*Amathes*), 22
 lubricipeda (*Spilosoma*), 22, 233, 257, 279
 lucina (*Nemeobius*), 22, 130, 148, 271
 lucipara (*Euplexia*), 22, 56
 luctuosa (*Acontia*), 20
 lunaris (*Oecophora*), 155
 lundana (*Ancylis*), 77
 luneburgensis (*Aporophyla*), 23
 lunosa (*Aporophyla*), 23
 lupinus (*Epinephele*), 137
 lupulinus (*Hepialus*), 141
 lurideola (*Lithosia*), 63
 lutea (*Xanthia*), 141
 lutealis (*Botys*), 75
 luteata (*A.*), 64
 luteolata (*Opisthograptis*), 12, 75
 lutescens (*Zygaena*), 13
 lutulenta (*Aporophyla*), 23
 lutulenta (*Epunda*), 42
 machaon (*Papilio*), 65, 69, 91, 128, 137, 155, 280
 maculalis (*Nacoleia*), 231
 macularia (*Venilia*), 12, 87, 115, 254
 maera (*Pararge*), 137
 maha (*Zizera*), 124
 malathana (*Catochrysops*), 282
 malvae (*Hesperia*), 65, 188, 189, 254
 mandela (*Pieris*), 113
 manni (*Pieris*), 36
 maravalica (*Nymphidium*), 24
 margaritaria (*Metrocampa*), 75
 margaritellus (*Crambus*), 76
 marginana (*Penthina*), 76
 marginaria (*Hybernia*), 75
 marginata (*Euchloë*), 69, 117, 258
 marginepunctata (*Acidalia*), 272
 masseyi (*Lycaena*), 42
 maura (*Mormo*), 22
 mayrana (*Peronea*), 76
 medicicaste (*Thais*), 148
 medon (*Aricia*), 114, 130, 211, 235, 260, 271, 273
 megaera (*Pararge*), 18, 19, 21, 66, 69, 117, 118, 119, 131, 137, 189
 melanops (*Lycaena*), 148
 meleager (*Lycaena*), 65
 memphis (*Anaea*), 113
 mendica (*Diaphora*), 68, 79, 116, 254, 258
 menthastri (*Spilosoma*), 22, 90, 188, 233, 279
 menyanthidis (*Acronycta*), 54, 141
 meticulosa (*Phlogophora*), 22, 253
 mi (*Euclidia*), 271
 miata (*Cidaria*), 56
 micacea (*Hydroecia*), 56, 111
 micra (*Thalpocharis*), 21
 minimellus (*Nemotois*), 189
 minimus (*Cupido*), 18, 19, 22, 42, 65, 211, 212, 238, 259
 miniosa (*Taeniocampa*), 63, 253
 minorata (*Emmelesia*), 64
 minuticornis (*Calpe*), 197
 mixtana (*Peronea*), 76
 moeniata (*Ortholitha*), 65

- molesta* (Laspeyresia), 255
monacharia (Phigalia), 12
moneta (Plusia), 43, 63, 88
monoglypha (Xylophasia), 23, 55, 63,
 163, 211, 213
montanata (Melanippe), 115
montanata (Xanthorhoë), 57, 87
Mothonica, 16
Mothonodes, 16
multistrigaria (Larentia), 63, 87
munda (Taeniocampa), 90, 117, 253
munitata (Coremia), 42, 56
murana (Scoparia), 75
muricata (Hyria), 42
muricata (Perizoma), 73
musculana (Cnephasia), 77
mygindana (Eucosma), 11
myricae (Acronycta), 54
myrmidone (Colias), 66
myrtillana (Ancylys), 77
myrtillata (Gnophos), 75
myrtilli (Anarta), 56
Nacoleia, 231
nana (Phalonia), 155
nanata (Eupithecia), 74, 156
napi (Pieris), 33, 34, 67, 92, 117, 130,
 188, 238, 259
narada (Amblypodia), 25
narada (Horsfieldia), 25
naradoides (Horsfieldia), 27
neapolisata (Xanthorhoë), 57
nebulosa (Aplecta), 211, 213
neleus (Marpesia), 113
nemorivaga (Coccyx), 78
nemorivaga (Epiblema), 11
neoridas (Erebia), 129
nerii (Daphnis), 278
nigra (Agrotis), 279
nigra (Aporophyla), 21, 23, 63
nigra (Gonodontis), 12, 90
nigricans (Agrotis), 141
nigricata (Boarmia), 12
nigricostana (Argyrolepia), 284
nigrofasciaria (Anticlea), 90, 253
nigrofulvata (Macaria), 12
nigronotata (Pieris), 117
nigro-rubida (Xylophasia), 55
nigrosparsata (Abraxas), 12
nimbella (Homoeosoma), 258
niveana (Peronea), 10
noctuella (Nemeophila), 75
nostrodamus (Gegenes), 138
nupta (Catocala), 238
obeliscata (Thera), 56
obliterata (Euchaeca), 137
oblongata (Eupithecia), 22, 118
obscura (Agrotis), 235
obscura (Palimpsestis), 54
obscura (Rusina), 56
obscuraria (Gnophos), 42
obscurata (Xanthorhoë), 57
obsoleta (Agriades), 114
obsoleta (Colias), 210
ocella (Eromene), 38
ocellata (Melanthia), 63
ocellata (Mesoleuca), 73, 87
ochrea (Triphaena), 55
ochrea (Xylophasia), 55
octogesima (Palimpsestis), 233
octomaculalis (Ennychia), 42, 118
oleracea (Mamestra), 22
olivata (Amoebe), 56, 64
ononaria (Aplasta), 72, 115
onopordii (Hesperia), 130
or (Palimpsestis), 54
orbifer (Hesperia), 138
orbitulus (Latorina), 46
orientalis (Carcharodus), 138
orla (Horsfieldia), 27
osseana (Aphelia), 64
osteodactyla (Alucita), 155
ostrina (Thalpochores), 115
ostrinalis (Pyrausta), 75
pagenstecheri (Heliconisa), 191
palaemon (Carterocephalus), 114
palárica (Erebia), 46
palealis (Spilodes), 258
pallens (Leucania), 273
pallida (Colias), 35
pallidior (Lycaena), 111
palpina (Notodonta), 273
palustris (Hydrilla), 115
pamphilus (Coenonympha), 22, 54, 65,
 131, 137, 156, 189, 190
pandora (Dryas), 130, 137
paphia (Argynnis), 117, 211, 238
paphia (Dryas), 21, 65, 92, 130
papilionaria (Geometra), 63, 155, 254
parthenias (Brepheos), 118, 253
parva (Thalpochores), 21, 115
pascuellus (Crambus), 69, 76
pavonia (Saturnia), 54
pavonia-major (Saturnia), 128
pedaria (Phigalia), 12, 75, 253
pellionella (Tinea), 78
peltigera (Heliothis), 162
pendularia (Ephyra), 141, 254
peneleos (Acraea), 282
penkleriana (Grapholitha), 77
penziana (Cnephasia), 77
perfuscata (Cidaria), 43, 56
perlepidana (Stigmonota), 63
petasitis (Hydraecia), 111
pflugiana (Epiblema), 284
pflugiana (Halonota), 77
phanias (Pedaliodes), 113
pheretes (Albulina), 46
Philoros, 135
Philosamia, 39
philoxenus (Coenonympha), 69
phlaeas (Chrysophanus), 18, 21, 22, 36,
 42, 86, 114, 118, 119, 130, 136, 138,
 156, 189, 190
phlaeas (Heodes), 24, 112, 259
phoebe (Melitaea), 130, 137
picta (Eurota), 113

- pictaria (Aleucis), 253
 pigra (Pygaera), 54
 pilosellae (Oxyptilus), 72
 pilosellae (Zygaena), 23
 pinastri (Hyloicus), 236
 piniaria (Bupalus), 75, 89
 pinivorana (Evetria), 155
 pinivorana (Retinia), 78
 pisi (Hadena), 42
 pisi (Mamestra), 55
 plagiata (Anaitis), 56, 283
 plantaginella (Gelechia), 155
 plantaginis (Parasemia), 54, 254, 259, 273
 *plateni (Horsfieldia), 29
 plecta (Noctua), 23, 55
 plumbaria (Ortholitha), 69
 plumbeolata (Eupithecia), 74
 podalirius (Papilio), 66, 128, 137
 polychloros (Vanessa), 14, 137
 polycommata, 63, 279
 polyphemus (Telea), 38, 163
 polytes (Papilio), 140
 populata (Lygris), 56, 141
 populi (Amorpha), 111
 populi (Limenitis), 66
 populi (Poecilocampa), 114
 porcellus (Metopsilus), 69
 porphyrea, 88
 posticana (Retinia), 11
 potatoria (Odonestis), 254
 praecox (Agrotis), 88, 118
 praelatella (Lampronia), 78
 praetellus (Crambus), 76
 prasina (Eurois), 233, 253
 pratana (Argyrolepia), 78
 pratorum (Papilio), 261
 primulae (Noctua), 22, 55
 proboscidalis (Hypena), 56
 pronuba (Triphaena), 22, 23, 42, 55, 253, 273
 pronubella (Roslerstammia), 11
 prorsa (Araschnia), 66
 prosapiaria (Ellopiia), 74
 provinciana (Peronea), 76
 pruinata (Pseudoterpna), 118
 pruinosana (Peronea), 76
 prunaria (Angerona), 12
 prunata (Cidaria), 115
 pruni (Strymon), 113
 psi (Acronycta), 22
 pudorina (Leucania), 258
 pulchella (Deiopeia), 20, 114, 137
 pulchellata (Eupithecia), 74
 pulchellata (Tephroclystis), 157
 pulchrina (Plusia), 56
 pulverulenta (Taeniocampa), 253
 pumilata (Eupithecia), 62, 74, 87, 253, 272
 punctidactyla (Amblyptilia), 76
 punctinalis (Boarmia), 13
 punctularia (Tephrosia), 254
 puniceus (Teracolus), 69
 purdeyana (Peronea), 72
 purdeyi (Rhyacionia), 72
 purpuralis (Pyrausta), 11, 75
 purpuralis (Zygaena), 13
 purpuraria (Lythria), 115
 pusaria (Cabera), 74
 pustulata (Phorodesma), 43, 211
 puta (Agrotis), 272
 putris (Axylia), 22
 pygas (Catagramma), 113
 pygmaeella (Argyresthia), 78
 pyralina (Cosmia), 233
 pyramidea (Amphipyra), 22
 pyrausta (Chalybe), 11
 pyrenaica (Latorina), 46
 quadriplicaria, 113
 quadripunctaria (Callimorpha), 196
 quadripunctata (Caradrina), 22, 111
 quadripunctata (Euchloë), 258
 quercana (Carcina), 255
 quercinaria (Ennomos), 22, 141
 quercus (Bombyx), 87
 quercus (Lasioampa), 54, 114, 280
 quercus (Zephyrus), 21, 114, 119, 189
 radiata (Euchloë), 69, 117
 ramburialis (Diasemia), 72
 ramella (Grapholitha), 77
 ramosana (Sarrothrips), 132
 rapae (Pieris), 17, 18, 21, 22, 34, 36, 63, 67, 92, 111, 130, 137, 188, 234, 253, 280
 rectilinea (Hyppa), 55
 repandata (Boarmia), 12, 43, 75, 211
 resinella (Evetria), 11
 reticulata (Neuria), 272
 retusa (Plastenis), 273
 revayana (Sarrothrips), 131
 rhamni (Gonepteryx), 21, 66, 88, 92, 128, 136, 189, 253, 280
 rhizolitha, 87
 rhomboidaria (Boarmia), 22
 rhynchosporella (Elachista), 78
 ribeana (Tortrix), 76
 *riojana (Thyreion), 226
 ripae (Agrotis), 118
 rivata (Xanthorhoe), 273
 roboraria (Boarmia), 43, 211
 rondoui (Erebina), 129
 rondoui (Polyommatus), 130
 rosana (Tortrix), 76
 rossi (Pieris), 130
 roxelana (Pararge), 137
 ruberata (Hydriomena), 73, 254
 rubi (Bombyx), 54
 rubi (Callophrys), 46, 67, 119, 189, 254, 258, 271
 rubi (Macrothylacia), 156, 166
 rubi (Noctua), 55
 rubrotibiella (Acrobasis), 112
 rufa (Noctua), 55
 rufana (Peronea), 76
 rufescens (Triphaena), 55
 rufillana (Semasia), 77

- rufimitrella* (Adela), 63
rumicis (Acronycta), 54
rurea (Xylophasia), 55
russula (Nemeophila), 43
rustica (Diaphora), 69, 79
sabellicae (Pieris), 238
sacraria (Sterrha), 20, 115, 237
sagittatus (Sarrothripus), 131
salaciella (Opostega), 78, 156
salicata (Malendyris), 56
salira (Horsfieldia), 29
sambucaria (Ourapteryx), 12, 22
Samia, 39
sanio (Diacrisia), 211
sao (Pyrgus), 130
satellititia (Scopelosoma), 253
Saturnia, 39
satyrata (Eupithecia), 74
scabiosae (Hemaris), 258
schmidtii (Chrysophanus), 42
schmidtii (Heodes), 112
schulziana (Mixodia), 77
scoliiformis (Sesia), 13
scopoliana (Catoptria), 78
scota (Coenonympha), 54
scota (Hipparchia), 53
scotica (Fumea), 11
sebrus (Lycaena), 148
secalis (Apamea), 23
sedi (Aporophyla), 23
segetum (Agrotis), 22
selene (Brenthis), 22, 23, 53, 69, 92, 117, 119, 211, 272
semele (Hipparchia), 53, 131, 156, 189, 273
semele (Satyrus), 66, 118, 119, 138, 211
semi-allous (Lycaena), 112
semiargus (Nomiades), 130
semibrunnea (Xylina), 20
semifuscana (Paedisca), 77
senex (Nudaria), 88
sequella (Cerostoma), 64
sexalisata (Lobophora), 87
shetlandica (Xanthorhoë), 57
sidae (Hesperia), 138, 148
sibylla (Limenitis), 92, 189, 211, 212, 272
silago (Xanthia), 56
similana (Halonota), 77
similata (Acidalia), 66
similis (Porthesia), 119
sinapis (Leptosia), 65, 92, 128, 137
smeathmanniana (Tortrix), 188
sociata (Xanthorhoë), 57, 87
sociella (Galleria), 76
sodorensium (Boarmia), 12
solandriana (Paedisca), 63, 77
sorbiana (Cacoezia), 195
sordida (H.), 272
sororcula (Lithosia), 271
sororculana (Penthina), 76, 179
spadicearia (Coremia), 56
sphegiformis (Sesia), 13
**splendidior* (Cal morpha), 196
**spolia* (Pseudaletis), 250
squamana (Leptogramma), 65
stabilis (Taeniocampa), 56, 253
statice (Ino), 190, 258, 259
statilinus (Satyrus), 131
stellatarum (Macroglossa), 66, 128, 212
Stenoma, 16
stigmatella (Gracilaria), 78, 157
stoninus (Sarrothripus), 131
straminata, 88
straminea (Argyrolepis), 78
strataria (Pachys), 90
strigosa (Acronycta), 114
strigula (Agrotis), 55
stygne (Erebia), 46
subcapucina (Peronea), 72
subchristana (Peronea), 76
subfulvata (Tephroclystis), 156
subhastata (Eulype), 73
subjectana (Cnepharia), 284
sublustis (Xylophasia), 273
subocellana (Grapholitha), 77
subrosea (Noctua), 115
subsericeata (Acidalia), 88, 272
succenturiata (Eupithecia), 118
sylvanus (Augiades), 65, 130, 138
**sylvia* (Zizera), 124
sylvinus (Hepialus), 75
syringella (Gracilaria), 78
tabaniformis (Sciapteron), 13
taedella (Coccyx), 78
taeniolella (Anacamptis), 156
tages (Nisoniades), 19, 42, 130, 148
tages (Thanaos), 189, 235, 254
tagis (Euchloë), 148
taminata (Bapta), 254
**tamsi* (Psectrotarsia), 225
taoana (Horsfieldia), 28
taraxaci (Caradrina), 22
Telea, 39
telicanus (Tarucus), 138
telmessia (Epinephele), 137
temerata (Bapta), 63
templi (D.), 89
tenebrella (Aristotelia), 78
tenebrosa (Rusina), 56
Teragra, 231
terrella (Gelechia), 78
testata (Lygris), 56, 141
tetraonis (Indarbela), 231
tetraquetella (Grapholitha), 77
thalassina (Mamestra), 69
**Thambotricha*, 270
thersamon (Heodes), 138
thersites (Agriades), 46, 138
thrasonella (Glyphipteryx), 78
thaleus (Hepialus), 141
tiliae (Mimas), 22, 69
tiphon (Coenonympha), 54, 69, 155
tithia (Dynamine), 113
tithonus (Epinephele), 93, 119, 131, 211
tolanus (Peronea), 72

- torquatus (*Papilio*), 113
 trayja (*Siproeta*), 113
 trepida (*Noctua*), 63
 trepida (*Notodonta*), 90
 triangulum (*Noctua*), 119
 trifolii (*Zygaena*), 13, 43, 157, 190, 273
 trigeminana (*Halonota*), 77
 trigrammica (*Grammesia*), 271
 trilinea (*Grammesia*), 163
 tringipennella (*Gracillaria*), 78
 triplasia (*Abrostola*), 22
 tripunctana (*Penthina*), 76
 trisignaria (*Eupithecia*), 237, 278
 tristata (*Xanthorhoe*), 57
 tritophus (*Notodonta*), 89
 truncata (*Cidaria*), 56, 68, 115, 272
 tumidana (*Acrobasis*), 112
 tyndarus (*Erebia*), 129
 typhon (*Coenonympha*), 113, 119, 122
 typica (*Naenia*), 22, 253, 272
 ulmata (*Abraxas*), 259
 ulmifoliella (*Lithocolletis*), 78
 unca (*Hydrelia*), 88
 uncula (*Hydrelia*), 231
 undulata (*Eucosmia*), 63
 unionalis (*Margarodes*), 21
 unipuncta (*Leucania*), 280
 unitaria (*A.*), 64
 upsilon (*Agrotis*), 22
 unguicella (*Ancylis*), 77
 urticae (*Aglais*), 18, 21, 22, 24, 43, 53,
 66, 92, 131, 136, 258
 urticae (*Vanessa*), 14, 88, 117, 118, 189
 vaccinii (*Orrhodia*), 253
 valesina (*Argynnis*), 238
 valesina (*Dryas*), 92
 varleyata (*Abraxas*), 12
 *vates (*Thamnotricha*), 270
 velleda (*Hepialus*), 75
 vellida (*Junonia*), 16
 *venosa (*Diaphora*), 79, 116
 venosata (*Eupithecia*), 88, 272
 verbasci (*Cucullia*), 190, 271, 273, 280
 verrucella (*Acrobasis*), 112
 vestigialis (*Agrotis*), 22
 vetusta (*Calocampa*), 56
 viburniana (*Tortrix*), 76
 viduaria (*Cleora*), 12
 villica (*Arctia*), 254
 viminalis (*Bombycia*), 55
 vinula (*Dicranura*), 212
 viretata (*Lobophora*), 11, 63, 87, 210
 virgata (*Hyppa*), 55
 virgaureae (*Heodes*), 65
 virgularia (*Acidalia*), 141
 viridana (*Tortrix*), 254
 viridaria (*Amoebe*), 56, 271
 viridaria (*Phytometra*), 42
 viridaria (*Prothymnia*), 56
 vitalbata (*Phybalapteryx*), 271, 272
 vitellina (*Leucania*), 62, 88, 280
 vulgata (*Eupithecia*), 22, 272
 w-album (*Thecla*), 21, 190, 210
 wauaria (*Thamnonoma*), 75
 xanthographa (*Noctua*), 22, 55, 280
 xerampelina (*Cirrhoedia*), 64
 zephyrus (*Polyommatus*), 137
 ziczac (*Notodonta*), 156, 273
 zonaria (*Nyssia*), 12, 118

Order XIX. COLEOPTERA.

- analis (*Grammoptera*), 24
 Aspidosoma, 174
 *atavellus (*Ergates*), 177
 autographus (*Dryocoetes*), 120
 bipunctata (*Pimelia*), 151
 breinii (*Anoplitis*), 177
 brevicollis (*Nebria*), 158
 Caliphotes, 174
 Callipogon, 177
 campestris (*Cicindela*), 136
 chalcographus (*Pityogenes*), 120
 chalybeata (*Gonophora*), 178
 concentrica (*Sphaeria*), 108
 consanguineus (*Photinus*), 173
 corruscus (*Phalacrus*), 108
 coryli (*Cryptocephalus*), 117
 curculionoides (*Mycterus*), 151
 cursor (*Lissodema*), 69
 exilis (*Meligethes*), 120
 faber (*Ergates*), 177
 huttoni (*Pentarthrum*), 69
 laticollis (*Phyllodecta*), 117
 *lepidus (*Exillis*), 152
 Luciola, 174
 lunatus (*Diphyllus*), 108
 maxillosus (*Creophilus*), 158, 183
 melanarius (*Omaseus*), 158
 micans (*Orchesia*), 108
 mucronata (*Tentyria*), 151
 olens (*Ocypus*), 158
 paniceum (*Anobium*), 120
 pedestris (*Formicomus*), 151
 polyphemus (*Ergates*), 177
 Polyrachis, 174
 sanctaecrucis (*Aspidomorpha*), 68
 serraticornis (*Pyrochroa*), 3
 spectabilis (*Ergates*), 177
 spiculatus (*Ergates*), 177
 taurus (*Onthophagus*), 116
 typographus (*Tomicus*), 120
 vulgaris (*Pterostichus*), 119, 158

Order XXI. DIPTERA.

apiformis (Pocota), 144
 autumnalis (Tabanus), 41
 Blepharicera, 135
 Blepharocera, 135
 bovinus (Tabanus), 40, 119
 bromius (Tabanus), 40
 caecutiens (Chrysops), 40
 Cecidomyia, 108
 Chrysops, 40
 distinguendus (Therioptectes), 156
 elegantula (Bibliocephala), 135
 excavata (Dicranomyia), 17
 *exhumata (Dicranomyia), 17
 fasciata (Stegomyia), 143
 fulvus (Atylotus), 41
 fusca (Bolitophila), 109
 griseicollis (Brachycampta), 182
 lasiophthalma (Lonchaea), 110
 maculata (Macrocera), 135

maculicornis (Tabanus), 40
 nervosus (Bibio), 49
 nigra (Mycetophila), 83
 obtusa (Hylephila), 69
 Philorus, 135
 pluvialis (Haematopota), 40
 punctata (Mycetophila), 183
 quadrata (Chrysops), 40
 relictia (Chrysops), 40
 richardi (Taeniorhynchus), 69
 Sciara, 3
 Sciophila, 110
 solstitialis (Therioptectes), 40
 sponsa (Hylephila), 69, 117
 sudeticus (Tabanus), 119
 Syrphus, 2
 Tabanus, 40
 tropicus (Therioptectes), 40

Order XXII. HYMENOPTERA.

abdominalis (Nematinus), 227
 aculeator (Proctotrypes), 59, 83
 alienata (Labidia), 49
 apterygonus (Paracodrus), 133, 185
 areolater (Disogmus), 3, 134
 ater (Exallonyx), 158, 183
 *auriceps (Australomphale), 207
 *Australoödera, 207
 *Australomphale, 207
 *Austroencyrtoidea, 206
 bethyloformis (Paracodrus), 186
 bicolor (Proctotrypes), 110
 bimaculatus (Eriodorus), 110
 brevicornis (Exallonyx), 160
 brevimanus (Proctotrypes), 59, 82
 brevipennis (Proctotrypes), 110
 buccatus (Proctotrypes), 2, 60, 132
 calcar (Proctotrypes), 2, 60, 133
 campanulator (Ichneumon), 109
 *chittii (Proctotrypes), 60, 159
 Cimbex, 49
 Cladius, 49
 Cryptoserphus, 2, 59
 curtipennis (Proctotrypes), 60, 134
 cyanescens (Xylocopa), 151
 *damoni (Aphelinus), 208
 *dei (Babinda), 205
 devagator (Proctotrypes), 60, 109
 Dineura, 49
 *disjecta (Eriocampa), 50
 Disogmus, 2
 distinctus (Psithyrus), 166
 elongatus (Proctotrypes), 2, 60, 133
 Eriocampa, 49
 Eriocampoides, 49
 erythromera (Spalangia), 24
 Exallonyx, 2, 59, 159

flavimanus (Geniocerus), 116
 *flaviventris (Neurotes), 204
 fuliginosus (Acanthomyops), 24
 fuliginosus (Lasius), 184
 fumipennis (Exallonyx), 182
 fuscipennis (Nematinus), 227
 fuscipes (Proctotrypes), 3, 60, 83, 134
 *gemmus (Mesocalocerinus), 206
 gladiator (Proctotrypes), 60, 110
 glomeratus (Apanteles), 281
 glomeratus (Microgaster), 245
 gravidator (Proctotrypes), 60, 109
 guineense (Tetramorium), 118
 hyalinipennis (Proctotrypes), 60, 157
 iridescens (Neurotes), 204
 Janus, 49
 kollari (Cynips), 109
 laeiventris (Exallonyx), 184
 laricis (Proctotrypes), 59, 82
 *laticapus (Mesanusia), 208
 *leichhardtii (Austroencyrtoidea), 206
 ligatus (Exallonyx), 183
 lineolata (Athalia), 231
 longicornis (Exallonyx), 160
 longitarsis (Proctotrypes), 59, 83
 luridiventris (Platycampus), 228
 luteus (Nematinus), 227
 Macrophyta, 49
 maderensis (Andrena), 91
 Megaxycla, 49
 *Mesanusia, 208
 *Mesocalocerinus, 206
 micrurus (Proctotrypes), 60, 158
 *mirum (Trichogramma), 207
 muraria (Chalicodoma), 151
 Neurotoma, 49
 niger (Exallonyx), 182

- nigricornis (Disogmus), 3
 obductus (Pachynematus), 227
 obfuscatus (Meteorius), 108
 *omnirubricornis (Eurytomocharis), 206
 orchesiae (Thersilochus), 108
 ovata (Eriocampa), 50
 pallidipes (Proctotrypes), 60
 *pallidistigma (Exallonyx), 182
 pallipes (Allantus), 227
 pallipes (Pristiphora), 68, 227
 pallipes (Proctotrypes), 135
 Paracodrus, 2, 184
 parvulus (Proctotrypes), 59, 108
 pavidus (Pteronidea), 228
 petrefacta (Megaxycla), 50
 Phaenoserphus, 2, 60
 Phenacoperga, 49
 portosanctana (Andrena), 91
 Proctotrypes, 1, 59
 Pseudocimbex, 49
 Pseudosiobla, 49
 Pteronius, 49
 *Raffaellia, 205
 *raffaellini (Habrolepoidea), 208
 ruficornis (Pristiphora), 228
 ruginodes (Myrmica), 184
 scabrinodes (Formica), 182
 Schizocerus, 49
 scutellaris (Melipona), 116
 Selandria, 49
 serotinus (Emphytus), 227
 Serphus, 2
 seticornis (Proctotrypes), 60, 134
 *sidneyi (Raffaellia), 205
 socialis (Exallonyx), 184
 Tenthredella, 49
 *tintoreti (Erythmelus), 205
 Trichiosoma, 50
 *varicornis (Australomphale), 207
 *varicornis (Australoödera), 207
 *vetusculus (Cimbex), 50
 viator (Proctotrypes), 60, 135, 158
 viminalis (Pteronius), 3
 violacea (Xyllocopa), 151
 virginalis (Angitia), 157
 vittatus (Amauronematus), 228
 vorax (Phylledestes), 50
 vulgaris (Vespa), 24
 wasmani (Exallonyx), 184
 westwoodi (Stenamma), 281
 wollastoni (Andrena), 91
 wollastoni (Halictus), 91
 xanthocerus (Exallonyx), 161

THE ENTOMOLOGIST.

VOL. LV.]

JANUARY, 1922.

JAN 16 1922

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

I. Subfamily PROCTOTRYPINÆ.

As is the case with nearly all the groups of our smaller insects, neglect has been the portion of the Oxyura for a great number of years; and it is a plaintive task to compare the general interest nowadays taken in entomology as a whole with that evinced by our grandfathers. Their numbers were certainly few, but ours, in the less-worked groups, are nugatory; nor can much more be said, in respect of this family of Hymenoptera, upon the Continent. Nothing but a well-sustained publication of the André's excellent 'Species des Hyménoptères d'Europe' has recently been issued of importance, but in this great work Kieffer has brought forward such a *foule* of new species, incorporated in a most comprehensive manner with those already published, that ignorance now lies at the door of wilfulness, and not necessity. In order that we should not be behind our neighbours in a knowledge of the Oxyura of Britain I have attempted, in the following concise tabulation and notes, to present a superficial notion of the 680 species already recorded from our islands, together with some initial idea of their distribution here.

The first of the eleven subfamilies into which the Oxyura are now divided is the typical one PROCTOTRYPINÆ, and this is distinguished from all the remainder by the following characters: Antennæ rising far from mouth. Scutellum neither discally bisulcate nor basally constricted. Abdomen not laterally margined by a carina. Wings no more than normally ciliate; front ones with a determinate stigma, but no discal triangle of nervures, its radial cell entire; hind ones not basally lobed or attenuate.

Until quite recently this subfamily consisted of the single genus *Proctotrypes*, which was beautifully monographed by Haliday in his 'Hymenoptera Britannica Oxyura,' fasc. i, published by Baillière in 1839. But nowadays it has been comminuted into several smaller groups upon characters not, perhaps, too trivial to regard as genera, though the facies are in every case the same, and it is of little moment whether we accord them this rank or simply that of divisions of a single genus. It is, as Vollenhoven says, "to be regretted that Haliday's most precious

paper on the *Oxyura* remained unknown to Thomson, whilst he wrote on this subject," but the circumstance seems to have given rise to little synonymy; the latter redescribed the abundant *P. calcar*, and possibly his *P. buccatus* is not distinct from Haliday's *P. elongatus*. Their specific distinction may be owed to Kieffer's habit of regarding everything as different till proved identical even to the last pilus (in the broadest sense of the word!). The affinities of this subfamily are not at all with the other *Oxyura*, but with the *Polymorphi* group of *Braconidæ*, wherein the *Euphorids* have equally peculiarly contracted radial cell and the *Liophronids* very similar abdomen, with reflexed terebra.

NOTA.—There has been a recent attempt to sink the name *Proctotrupes* (originally spelt "Proctotrupes," presumably because the Germans possess no *y*) to *Serphus*. Science is the essence of common sense; consequently, to alter a name that has been in universal use by scientists from the earliest times, the particular name, moreover, by which an entire group of Hymenopterous insects is known, in favour of one utterly unknown, one that is so similar to *Syrphus* of Fabricius (which antedates it) that in speech they are identical, to say nothing of any doubt that may exist respecting the synonymy—such a proceeding is, I have no hesitation in definitely stating, so far from common sense as to border upon folly. Such a course shall never be accepted by me.

TABLE OF GENERA.

(6). 1. Metathorax scabrous, or, at least, with a central carina.

(5). 2. Mesothoracic notauli entirely wanting.

(4). 3. All the tarsal joints and claws simple.

PROCTOTRUPES, Latr.

(3). 4. Anterior claws trifold, fifth joint explanate.

EXALLONYX, Först.

(2). 5. Mesothoracic notauli deeply impressed DISOGMUS, Först.

(1). 6. Metathorax smooth, with no central carina.

PARACODRUS, Kieff.

But for practical use, in a rough and ready way, I have found the following conspectus sufficiently comprehensive:

Metathorax rugose or scarbriculous throughout.

Notauli deeply impressed 1. *Disogmus*.

Notauli wanting.

Propleuræ striate; abdomen red 3. "*Serphus*," Kieff.

Propleuræ smooth; abdomen black.

Claws dentate; onychii explanate 4. *Exallonyx*.

Claws simple; onychii slender 3. "*Phænoserphus*," Kf.

Metanotum at least partly smooth, nitidulous

Metathorax with smooth discal areæ 2. "*Cryptoserphus*," Kf.

Metathorax entirely smooth throughout 5. *Paracodrus*.

DISOGMUS, Förster.

Hym. Stud., ii, 1856, p. 99.

Eleven European and three American species are known. We have but two :

- (2). 1. Pronotum laterally tuberculate ; metanotum tricarinate.
1. *areolator*, Hal.
(1). 2. Pronotum not tuberculate ; metanotum unicarinate.
2. *nigricornis*, Kief.

1. DISOGMUS AREOLATOR, Hal.

Proctotrupes areolator, Hal., Hym. Brit., i, 1839, p. 13, ♂ ♀. Curt., Brit. Entom., xvi. 1839. pl. dcxlv, ♀. *Disogmus areolator*, Först., *lib. cit.*, p. 100, ♂; Ashmead, Bull. U.S. Nat. Mus., 1893, p. 332, pl. xiii, fig. 6; André, Spp. Hym. Eur., x, 1907, pl. xi, fig. 6, p. 283, ♂ ♀.

This species is at present confined to Britain and is among our rarer kinds. Taken in sylvan places in Ireland during the autumn by Haliday and in England by Walker. It has occurred to me singly on bracken at Wilverley Inclosure in the New Forest, and by sweeping long grass at Wortham in Suffolk, both in the middle of June. That it is actually much less rare than would seem is proved by its existence in my Monks Soham garden, where I have never through fifteen years found it wild. On April 10th, 1907, a piece of ordinary old willow-stump was brought in from this garden, bored by insects; in the early morning of May 10th a female of the present species had emerged therefrom; two more were out on 13th inst., and made no attempt to come up to the light; on 20th a fourth emerged; on 18th a single *Proctotrypes fuscipes* was bred; but the only other emergants were one female sawfly, *Pteronus riminalis*, on 21st at 11 a.m., four very small—too small, I think, to have been hosts of this parasite—dipterous *Sciara* sp. on 13th and 20th, and a couple of the heteromerous beetle, *Pyrochroa serraticornis*, on 13th and 20th. On May 20th, 1910, Mr. Ernest A. Elliott took the species in some quantities in his garden at Belsize Grove, in Hampstead, running over a half-decayed black poplar billet, recently felled; it was noticed upon this and a similar billet from the same tree for four years in succession, until the wood rotted and fell to pieces, in annually increasing numbers, but no probable host was detected (such as the above *P. serraticornis*). I have seen one pair from Nottingham in May, on 6th at Radcliffe-on-Trent and on 15th at Glapton, near Clifton.

2. DISOGMUS NIGRICORNIS, Kieff.

André, *lib. cit.*, p. 285. ♂.

Unknown to me, and doubtfully British: "France et probablement Ecosse"—Kieffer, *l.c.*

NOTES ON BRITISH ODONATA IN 1920.

By W. J. LUCAS, B.A., F.E.S.

For myself the season commenced rather late with the capture of *Pyrrhosoma nymphula*, Sulz. (a female) and *Enallagma cyathigerum*, Charp. (also a female), both in teneral condition, on 3 May at the Black Pond on Esher Common, Surrey. Thence onwards dragonflies were met with till towards the end of October.

LIBELLULIDÆ.—*Leucorrhinia dubia*, Lind. was very common at Abbot's Moss, Cheshire, in May and June (Jackson). A male and a female of *Sympetrum striolatum*, Charp. were sent to me in teneral condition, with the note that they were in remarkable profusion (14 August) on the sand dunes of the South Lancashire coast about Formby Point. They seemed very partial to resting on the Ragwort, which is a feature of the vegetation (Dallman). It was met with near Lewes, Sussex, in September (Blair). There is one record of *Sympetrum flaveolum*, Linn.—a female taken on 19 Aug. by the River Wey in the Royal Horticultural Society's Gardens near Wisley, Surrey (Fox-Wilson). *Sympetrum scoticum*, Don. was on the wing at the Black Pond, Esher Common, on 15 July, but examples seemed to be teneral and probably the species was only just appearing. By 7 Aug. it was common there and a few were black in colour, but most were of a saffron tint and no doubt represented teneral males as well as females. On 7 Oct. a number were seen on the Common, and at least one was noticed on 25 Oct. (Lucas). Stowell met with it on Parley Heath (apparently in August), and strange to say this seems to be almost or quite the only record of its occurrence in Dorset. *Libellula depressa*, Linn. was common in Alice Holt, Hampshire, on 24 May (Stowell). On the 21st of the same month one at least was sighted in the New Forest. On 25 May it was seen on the shore near Mudeford, Hants, presumably having bred in the pools there, the water in which was no doubt brackish. An *Orthetrum cancellatum*, Linn. was taken at the same pools on the same day and presumably also bred there. On 25 June a nice male *L. depressa* was taken in the New Forest, where the species appeared to be pretty common. Several *L. depressa* were seen on 3 June and a yellowish teneral male was taken at Stanmore Common, Middlesex (Lucas). One *Libellula quadrimaculata*, Linn. at least was seen on 25 May over the marshy ground (no doubt brackish, if not salt) between Hengistbury Head and Christchurch Harbour, Hants. Possibly the species breeds in the marsh! One was almost certainly seen on 7 Oct. at Esher Common; if captured, this would have been a remarkably late record, for the species often appears upon the wing in April (Lucas). On 21 June *Orthetrum cærulescens*,

Fabr. was on the wing in the New Forest, though it was only occasionally that a blue specimen was seen (Lucas). On 30 May in Oberwater, New Forest, I found three naiads* of what I presumed to be *O. cærulescens* and took them away with the hope of breeding them. On the morning of 10 June a male was found to have emerged since the previous evening, and was hanging about 9 a.m. (s.t.) with wings pressed together over its back. About an hour later it had spread its wings, which were seen to be very glossy. The pterostigma was yellowish, and the body various shades of brown with yellowish markings. The insect was a male, and *O. cærulescens* as I expected. On 14 June it was moribund. It had been kept under a glass shade and had eaten nothing. Some of the gloss had disappeared from the wings, but the "cerulean" bloom had not developed on the abdomen. Another male emerged on 22 June. It had been on a stick above water about a couple of days, but remained wet (perhaps the tip of the body touched the water, which spread over its hairy surface). The third specimen was put in formalin for figuring and description. The latter follows:

DESCRIPTION.—*Body generally* of a rather warm sepia tint (but the colour is often hidden, the body being incrustated with mud or decayed bog material); hairy; somewhat cylindrical above, and therefore not so much spread out as some Libellulines. *Length* including appendages some 19 mm.; greatest *breadth* about 5.5 mm. *Head* somewhat pentagonal in shape; transversely about 5 mm.; fairly broad from front to back—about 3.5 mm.; top of head (*epicranium*) convex; *occiput* well developed, hind margin a little concave. *Antennæ* of 7 segments, basal two short and swollen, the next slender and about equal in length to the basal two together, the rest slender and sub-equal; hairy. *Eyes*—the spherical part prominent at each fore corner of the head, with a prolongation backwards reaching about one-third across the head. *Labium* (mask) rather short; but just extending beyond the insertion of the fore legs; spoon-shaped; deeply concave; inner surface bearing scattered hairs (or slender spines); submentum narrow; mentum becoming rather suddenly broader; mid lobe finely crenated, with about 13 crenations on each side of the mid point, a minute spine in each depression; mid lobe making a decidedly obtuse angle in front, produced centrally into a blunt point, a short ridge leading up to the point internally; lateral lobes (*palpi*) triangular, concave, distal border with a few (about 7) shallow crenulations and irregularly arranged spines near the margin; inner margin entire; outer margin entire and considerably thickened; *mental setæ* in two

* Comstock in his "Introduction to Entomology" (Ithaca, 1920) proposes (p. 179) to restrict the term "nymph" to the immature instars of insects with *gradual* metamorphosis (e.g. grasshoppers), to use the term *naiad* for those with *incomplete* metamorphosis (e.g. dragonflies and mayflies), reserving the terms *larvæ* and *pupæ* for the earlier stages of insects with *complete* metamorphosis (e.g. butterflies and beetles). As there seem to be advantages in this arrangement. I have used the term *naiad* in this article.

series, each consisting of two long slender spines near the outer margin disconnected from the remainder (about 18), which are



ORTHETRUM CÆRULESCENS, Fabr.

W. J. Lucas, del.

Naiad ($\times 4$); a. Labium (\times about 5); b. moveable hook (\times about 22).

shorter and decreasing in length towards the centre, where they terminate in a cluster of about 12 (so that the mental setæ are in all about 40); lateral setæ 3 on each side (occasionally perhaps 4)

rising from distinct bases, rather long and slender, subequal (a few smaller spines, irregularly arranged, on the actual margin; in one specimen one on each palp was longer than the rest and might have been taken for a fourth seta had it been in line with the other three); *moveable hook* dark, rather short, somewhat slender, sharp pointed, about one-fourth to one-third the length of the outer margin of the palp. *Prothorax* collar-like, with a fringe of hairs. Combined *meso-* and *meta-thorax* small, hairy. *Mesothoracic spiracles* very pronounced. *Wing-cases* reaching nearly to the distal edge of the fifth abdominal segment. *Legs* rather short, sturdy, hairy; fore about 8 mm. long, mid about 9 mm., hind about 15 mm.; femora and tibiae about equal; 3-segmented tarsi shorter, the basal two segments in fore and mid legs being short; claws rather long, curved, sharp-pointed. *Abdomen* slightly hairy; broadest about the sixth segment, contracting slightly forwards, gradually tapering to the tip of the appendages behind; subcylindrically arched above, flattened ventrally; colour a fairly uniform brown, the sutures paler; segments subequal in width, except the tenth, which is much narrower; a blunt mid-dorsal spine near the hind margin of segments 4-7 that on 5 being most prominent, surrounded by some longish hairs, continued as a slightly raised smooth space on 8 and 9; small lateral spines on segments 8 and 9. *Dorsal anal appendage* triangular, about as long as segments 9 and 10 together; *male process* fairly prominent; *cerci* just longer than the dorsal appendage; *circoids* about half the length of the cerci; all five appendages sharp-pointed. [Material: two New Forest naiads bred in 1920; one, captured at the same time, preserved in formalin; five other skins found in the New Forest under conditions which left no doubt as to their identity.]*

Of *Cordulia aenea*, Linn. several were seen and one was taken in Alice Holt on 24 May (Stowell); a female was taken at Camberley, Surrey, on 28 May (Green); two females were captured at Abbot's Moss on 31 May and about 7 June (Jackson); and a female was caught at Horsley, Surrey, on 9 June (Lucas).

ÆSCHNIDÆ.—On 22 May a somewhat teneral female *Gomphus vulgatissimus*, Linn. was taken in the New Forest (Lucas). A male *Cordulegaster annulatus*, Latr. was captured in the Forest of Dean in June (Jackson). Near Lymington, Hants, *Brachytron pratense*, Müll. was found to frequent a very boggy birch wood in Roydon Woods: 15 May was the earliest date on which it was seen (Sones). There are two records of *Æschna mixta*, Latr.—a male at Brighton in August (Killington) and a specimen near Lewes in September (Blair). A teneral female of *Æ. juncea*, Linn. was taken at the Byfleet Canal, Surrey, on the occasion of the S. Lond. Ent. and Nat. Hist. Society's Excursion there on 24 July. On 12 Sept. a female *Æ. cyanea*, Müll. was taken at Rainow, Cheshire, in which the

* Dr. E. Rousseau in 'Ann. Ent. Soc. Belgique,' lii. (1908), p. 286, has given a description, which in the matter of the labium does not agree entirely with the New Forest examples. He does not give the source of his material.

pterostigma looked rather larger than usual. Both right wings and the left hind one had a cross-vein on the pterostigma (Neave). Such a cross-vein seems to be exceptional, and this example had three. The species was taken at Horsley, Surrey, on 8 Oct. (Blair). On 28 June a naiad was taken at Marlborough Deep in the New Forest, and from it the same evening a female imago emerged. At 7.20 (s.t.) the thorax was noticed partly out; emergence, however, had but recently commenced. By 7.24 the head and fore legs had emerged, and at 7.25 the mid and hind legs were out. The "rest" then commenced and lasted till 7.59. There was at first during this "rest" a good deal of twitching of legs and lower lip in a somewhat rhythmic manner. During the latter part it became less, the hind and mid legs becoming practically still, fore legs and lip slowing down and becoming still later. During the "rest" the body twitched violently a few times. At the end there was a sudden jerk forwards and speedy extraction of the tip of the abdomen, which was then a little longer than the abdomen of the naiad. The imago—yellowish-green with browner markings—was now hanging to the empty skin. The wings then began to expand from the base, and during most of the time occupied in the expansion there was a slight (or more pronounced) swaying of the abdomen backwards and forwards. By 8.10 the wings had extended till they were about opposite the tip of the abdominal appendages, but the abdomen had apparently also lengthened a little. The extension of the wings was more rapid towards the end of the period. At 8.12 they reached much beyond the tip of the appendages. At 8.15 they were about full length and of a beautiful pale yellowish-green colour. The face had by now turned from green to yellow. The abdomen was arched round the margin of the wings. At 8.23 the wings were flat and becoming slightly transparent. The abdomen extended but slowly: at 8.32 it was contracting and extending slightly, up and down, but the tip of the appendages was still more than half an inch short of the tip of the wings. At 8.45 I had to leave it for about an hour and a half, the abdomen then being not much longer than at 8.32. On my return the abdomen was fully extended. The dragonfly spread its wings in the darkness, and flew off to the window in the morning, the wings then being very glossy.

On 9 June a brown-winged *Æschna* flew by at close quarters near Horsley: it could only have been *Æ. grandis*, Linn. and if a capture had been made it would have constituted an early date for the species (Lucas). It was taken at Delamere in August (Jackson). On 3 Oct. one was seen flying over the Long Water at Hampton Court, Middlesex (Lucas).

CALOPTERYGIDÆ.—*Calopteryx virgo*, Linn. was swarming in Alice Holt on 24 May; "the wood was in parts all alive with them, largely more or less immature" (Stowell). In the New

Forest a very teneral female was caught on 20 May; on 21 May it was frequently seen in teneral condition; by the end of the month it could be obtained of good colour. The species was pretty numerous on 18 and 19 June; on the 22nd it was very common, especially over sunny pools of Blackwater. Twice one was seen with prey which appeared to be *Tortrix viridana*, Linn., but, contrary to the habit of many dragonflies with prey, it was too restless for capture; one secured with prey had caught a sub-imago of the Mayfly *Ephemera danica*, Müll. A male of *C. splendens*, Harris was met with in May at Hampton Waterworks, Middlesex (Blair).

LESTIDÆ.—*Lestes sponsa*, Hans. was taken on Studland Heath, Dorset on 16 Aug. (Stowell), and near Lewes in September (Blair).

AGRIONIDÆ.—*Platycnemis pennipes*, Pall. was well out in the New Forest on 23 June, and usually full coloured: it had clearly been out some days at least. On 30 June it was very common there as well as its whitish form—var. *lactea*, Charp. *Pyrrhosoma nymphula*, Sulz. was common at Wicken Fen on 9 May (Lyle); it was taken, somewhat teneral, in the Royal Hort. Soc. Gardens on 8 May (Lucas); by 24 May it had been out some time in Alice Holt (Stowell). In the New Forest one was caught on 10 May in rather teneral condition; on 21 May it was sometimes fairly mature in colour and texture; by the end of the month it could be obtained of good colour. The species was obtained mature as well as teneral on 3 June at Stanmore Common, Middlesex (Lucas). *P. tenellum*, Vill. was captured, teneral, on 21 June in the New Forest; it was very common there on the 30th of the month. An example of the var. *melanogastrum*, Selys was secured in the Forest on 10 Sept. (Lucas). On various occasions and in a number of its known haunts in the New Forest *Ischnura pumilio*, Charp. was sought for in 1920, but without success, and it seems certain that this little dragonfly has disappeared, at any rate for the time being (Lucas). Its congener, *I. elegans*, Lind. was captured at Hatchmere, Cheshire, in August (Jackson); it was met with as late as 14 Sept. near Hythe in the New Forest (Lucas). *Agrion pulchellum*, Lind. is reported from Delamere in June (Jackson). *A. puella*, Linn. was taken at Stanmore Common on 3 June, and at Epsom Common, Surrey, on 11 June (Lucas); at Rainow, Cheshire, on 7 Aug. (Neave). On 21 June both sexes of *A. mercuriale*, Charp. were found at Duck-hole Bog in the New Forest, males being numerous. Most were mature in colouring, and one or two cases of connection *per collum* were noticed. At Oberwater on 30 June males were very common; a few females also were taken. This sex always appears to be less common in this species than the male, but it is possibly because the females are less active. In one female the blue colouring was very deep,

but the markings were normal. On 7 July F. J. Killington sent me for inspection two males with very abnormal markings on the second abdominal segment. In one the two forward horns of the mercury-sign were detached, in the other they had practically disappeared altogether. These, with normal examples, were taken at the River Itchin, Eastleigh, Hants. He reported that the species entirely disappeared after the spell of bad weather (*sc.* in mid August). *Enallagma cyathigerum*, Charp. was taken (mature and teneral) at Stanmore Common on 3 June, and at Epsom Common on 11 June (Lucas); at Studland Heath on 16 Aug. (Stowell); and at Wicken Fen on 15 Aug. (Lyle).

Kingston-on-Thames;
October, 1921.

NOTES ON THE LEPIDOPTERA OF GLEN FENDER, PERTHSHIRE, AND INVERSHIN, SUTHERLANDSHIRE.

BY THE LATE F. G. WHITTLE, F.E.S.

A STAY at Glen Fender in April last was the means of my getting an introduction to *Peronea niveana*. Two of the examples obtained were on pine trunks, where they were conspicuous. One was beaten out of pine. All were in good order. It is curious that, although I gave a lot of attention to the birches, I did not find, either by searching or beating, even one *P. niveana*. I did, however, find a beautiful series of freshly-emerged, well-marked *Lobophora carpinata*.

Acanthopsyche atra ♀ from a pupa obtained on a fence near Blair Atholl, exposed on the sill of my bedroom window and watched several times daily for male visitors, failed to attract, unless visits were paid in the small hours of the morning, which is unlikely.

Zelleria hepariella was beaten out of ash in Glen Tilt on April 26th.

I suppose it often happens during the winter months, when collectors are able to find time to consult old records, that volumes of the 'Entomologist,' 'Intelligencer,' 'Record,' 'Monthly Magazine,' are taken down, and notes made to be put to good use in the ensuing season. Last winter, when so engaged, I came across a note by no less an authority than the late H. T. Stainton on E. C. Buxton's remarkable capture in the valley of the Shin ('E.M.M.', vol. xx, p. 81). I resolved that I would, if possible, spend a few weeks in that district at the proper time. Early in May I arrived at Invershin for Inveran, just above the junction of the rivers Oykel and Shin. Though I failed to find either of the two great rarities, I did not find my visit unprofitable. Several interesting species occurred in moderate numbers. A

Fumea like *casta*, but larger, quite 15 mm. in wing expanse, was bred from two or three spun-up cases found on a rock. They are, I think there is little doubt, the *Fumea scotica*, Chapman. I searched carefully for cases, but they were scarce; less than half-a-dozen were obtained, all of them on one boulder, from one of which the moth had already emerged.

I was surprised to find *Lobophora viretata* so far north. An example of *Peronea niveana* was found on a rock by the side of the Shin; also *Cydia fractifasciana* on the moor. Near the river bank, among *Arctostaphylos uva ursi*, *Eucosma arbutella* and *E. mygindana* sparingly; *Epiblema nemorivaga* more freely. Some of the *Pyrausta purpuralis* obtained were unusually bright.

On my return home I visited the Natural History Museum, and had the pleasure of an interview with Mr. Durrant. He it was who, always helpful, drew my attention to Buxton's own communication (which I had somehow missed) to the 'Entomologist,' vol. iii, pp. 24, 25, in which further and more precise particulars are given of the capture, in the years 1853 and 1854 respectively, of *Chalybe pyrausta* and *Roslerstammia pronubella* between the upper and lower falls of the Shin.

At Invershin, close to the inn and railway station, some insects of special interest occurred. They were for the most part in small numbers, but the quality was good—*Retinia posticana*, *Laspeyresia cognatana* (well marked and of large size), *Evetria resinella* abundant. I was pleased to breed a very handsome *Cosmophorana* from resin balls gathered for *Resinella*. *Thera cognata* and *T. juniperata* larvæ were beaten from juniper, and with them *Eriocephala aureatella* imagines in some numbers.

[The above notes were written by Mr. Whittle a few days before his death. It is not surprising that he did not meet with the rare Lepidoptera reported by E. C. Buxton from Invershin, supposing that they are still to be found there; for, with respect to *Chalybe pyrausta*, I know he expected to find it amongst its reputed food-plant, *Thalictrum*, but Buxton states that he thought he beat it from blackthorn, *Roslerstammia pronubella*, from beech. Buxton's recollections, written thirteen years afterwards, are probably at fault, for I do not think there is any blackthorn on the banks of the Shin, and I am still more strongly of opinion that beech does not grow there. I presume for beech one should read birch, which is abundant; the only other trees I can recollect there are willow and rowan. Mr. Whittle wrote me in May last that he had found a species of *Thalictrum* growing at Invershin, probably *T. alpinum*.—W. G. SHELDON.]

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from vol. liv, p. 289.)

GEOMETRIDÆ, GEOMETRINÆ.

(Arranged according to L. B. Prout's classification in Seitz's 'Palearctic Macrolepidoptera.')

Abraxas grossulariata.—A very varied series of 135.

Most of the specimens are wild ones, with the variation tending to an increase of the black coloration, but two specimens from the Meldola Collection, taken in Wigtonshire, are almost quite white. Among the bred specimens are 3 var. *nigrosparsata*, 6 var. *lacticolor*, and 9 var. *varleyata*.

Angeroma prunaria.—A remarkable specimen of the ab. *corylaria* type from the Meldola Collection labelled "Essex. Chingford," has the usually dark base and outer margins of a pale ochreous colour with a reddish orange central band.

Gonodontis bidentata.—In the long series are 13 ab. *nigra*, Prout, from Yorkshire, and 14 from the Manchester district.

Ourapteryx sambucaria.—A specimen from the Chitty Collection, labelled "E. Woodhay, 1882," is almost pure white. A specimen of a second brood was presented by Mr. J. Collins, taken by him October 3rd, 1921.

Opisthograptis luteolata.—A specimen from the Meldola Collection, bred from a Perthshire larva, May 5th, 1912, has both hind wings and the lower half of the left fore wing pure white.

Venilia macularia.—A specimen from the Meldola Collection labelled "Kent, Dartford, June 25, 1872," is almost pure yellow, a few of the normal dark markings being very faintly shown by a pale ochreous colouring.

Macaria liturata.—The series includes 6 specimens of ab. *nigrofulvata*, Collins, 2 from North Staffs, and 4 from Delamere.

Phigalia pedaria.—The series includes many specimens of ab. *extinctaria* and ab. *monacharia*.

Nyssia zonaria.—A long series from Cheshire and Lancs, and 4 from Tiree.

Pœcilopsis lapponaria.—A long series of both ♂ and ♀.

Biston betularia.—The long series includes several forms intermediate between the type and ab. *doubledayaria*.

Boarmia repandata.—Series of over 200.

Ab. *conversaria*, ab. *nigricata* and ab. *sodorensium* are well represented. The restriction of the melanic forms to the North Midland and Northern English Counties is well illustrated.

Cleora arenaria (viduaria).—Series of 7 from the Spilsbury Collection, and 1 from the Sellon Collection.

Boarmia punctinalis (consortaria).—A long series of typical forms, and 12 melanic specimens bred from Sutton Coldfield stock, obtained from L. W. Newman.

Ectropis crepuscularia.—The long series contains many specimens of ab. *delamerensis*, from S. Wales, N. Staffs, Cheshire and Cumberland.

E. bistortata (biundularia).—Twenty melanic specimens from Swansea are included in the series.

E. consonaria.—The series includes 15 melanic specimens bred from larvæ of Rainham stock obtained from L. W. Newman.

Isturgia linbaria.—A long series from the Spilsbury and Chitty Collections without data, 6 from the Meldola Collection labelled "Ipswich, 1895," and 2 from the Pogson Smith Collection labelled "Ross-shire, Achanalt, 6, 91."

Ematurga atomaria.—A long and very varied series. A most remarkable male specimen from the Chitty Collection and labelled "New Forest, 1887," is pure pale yellow without any markings at all.

Itame fulvaria (brunneata).—A long series from Perthshire and Aberdeenshire, and two specimens from North Staffs taken in June, 1920.

Chiasmia clathrata.—A remarkable specimen from the Pogson Smith Collection taken at Nettlebed, Oxon., in August, 1892, has the ground-colour of a uniform chocolate. Towards the outer margin of all four wings are a few small white spots.

ZYGENIDÆ.

Zygæna purpuralis.—A long series from N. Wales, Galway and Clare.

Z. achilleæ.—A series of 8 taken near Oban in 1919 by P. C. Reid, Esq., presented by him.

Z. trifolii.—A very long and varied series showing almost every form of variation, including var. *lutescens*, Cockl., from Emsworth, presented by W. M. Christy, Esq.

Z. filipendulæ.—Nine examples of ab. *flava*, Robson, bred by L. W. Newman from Kentish stock.

SESIIDÆ.

Sciapteron tabaniformis.—Three specimens. One from the Hope Collection labelled "Ealing Gardens, 1853." One from the Spilsbury Collection without date. The third from the Sellon Collection labelled "Cummings Collection."

Sesia scoliæformis.—A series of 14 from Rannoch, and a larva taken by myself in Cannock Chase, June 7th, 1920.

S. sphegiformis.—Four specimens bred Berkshire, presented by C. Rippon, Esq. Three from the Sellon Collection labelled "Tilgate Forest," and 10 from North Staffs taken at flowers, June, 1919, by myself.

S. andreniformis.—Series of 11 with full data, all from Kent. Three from the Meldola Collection, 8 presented by B. G. Adams, Esq.

HEPIALIDÆ.

Hepialus humuli.—Included in the series are over 70 specimens of var. *hethlandica*.

(To be continued.)

NOTES ON *VANESSID* LARVÆ.

BY PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N.,
F.L.S., F.E.S.

In the 'Entomologist' for 1864-5, vol. ii, p. 132, Mr. J. R. S. Clifford surmises that the larvæ of *V. urticæ* and of the genus *Vanessa* in general are remarkably exempt from the attacks of ichneumons. This is not quite my experience, for since I began collecting—as long ago as 1855—I must have fed up many hundreds of larvæ of *Urticæ*, *Io* and *polychloros*, and I generally found that they were more or less infected with parasites. In two instances I remember having had large broods of the larvæ of *polychloros*, and only bred a single butterfly from each lot.

This year, on June 10th, I found a nest of very young larvæ of *V. urticæ*. They were spun up among the terminal leaves of a couple of stems of nettle, growing side by side, and almost touching, and appeared to be divided into two little family parties, one of which contained twice as many larvæ as the other. I took the largest lot, which comprised, as far as I could guess, from 150 to 200 larvæ, and left the other. I judged from their size they were about two days old. I had read somewhere that if the larvæ are taken very young they are seldom found to be ichneumonated, and I thought this would be a good opportunity of testing the truth of the statement.

On reaching home I put the larvæ, in their little nest, under a large glass cylinder, with some nettles pulled up by the roots and plunged into a wide-mouthed bottle beneath it. The larvæ grew fast, and in a few days had reduced the leaves near their nest to mere skeletons. By June 20th they were more than half grown, and were in a very healthy-looking condition. On this day I went to the place where I found them on the 10th of the month, to see how those I had left behind were getting on. They appeared to be a trifle larger than those I had at home, had quitted their nest and were scattered about the plant. I took all I could find—just 50—and when I got home they were placed under a separate cylinder. By June 25th they were in their last skins, and were consuming a large quantity of food. In the first cylinder (the one that contained the first lot of larvæ) they were

too crowded, so I divided them into three lots, under separate cylinders. I now had four cylinders on the table in front of my sitting-room window, where I could see and note everything that went on.

On June 29th one or two of the second lot of larvæ, taken on the 20th, suspended themselves from the muslin roof of the cylinder, but others seemed to have some difficulty in doing so, and were evidently suffering from the attacks of parasites. A few had ceased to feed and were resting in a listless humped-up condition on their food-plant. The larvæ in the other cylinders—those taken on June 10th—were all feeding up well and rapidly, and by July 1st had become pupæ. At this date of the second lot of larvæ only seven had changed to pupæ, and the remainder appeared to be stung, and I found several fat white maggots wriggling about on the paper on which the cylinder was standing, and also a number of dark reddish-brown fly pupæ about the size of those of the common house-fly.

The first butterflies emerged on July 14th and by the 18th they had all hatched out as follows :

Seven only from the 50 larvæ taken on June 20th ; the rest were all ichneumonized or died.

Of the 141 larvæ comprising the first lot—taken June 10th—every one produced a butterfly, so this seems to prove that very young larvæ are not attacked by parasites.

On August 1st I found another small brood of larvæ, about half grown, and took 58 of them. This was probably a second brood. By the 12th most of them had changed to pupæ, but there were six or seven white maggots and a few brown fly pupæ lying on the paper beneath the cylinder. The butterflies emerged on August 21st and 22nd, 46 altogether, so only 12 of these larvæ failed to produce imagines. This brood therefore seems to have escaped the attention of parasites to a considerable extent. The larvæ were found in a bed of nettles beneath the shadow of some willow trees, where they were more or less sheltered.

In various countries abroad I found such *Vanessid* larvæ as I attempted to rear on board ship were singularly free from the attacks of parasites. In 1878, when up the Dardanelles in H.M.S. "Cygnet"—during the Russo-Turkish war—the larvæ of *V. antiopa* were abundant on both sides of the Straits throughout May and June. In the neighbourhood of Gallipoli, on June 13th, I noticed a number of full-grown larvæ wandering about the branches of a small willow tree as if they were looking for sheltered positions where they could attach themselves for pupation. I took 30 of the largest, and when I returned to the ship put them into an empty biscuit tin, and tied a piece of muslin over the top. The next morning they were all hanging to the muslin, and by the evening of the 15th had become pupæ. The butterflies emerged on the 26th, and were most magnificent

specimens, the largest I have ever seen. There were no signs of ichneumons.

At Lyttelton, near Christchurch, New Zealand, on January 27th, 1884, I found the larvæ and pupæ of the beautiful *Pyrameis gonerilla*, Fabr., plentiful among nettles in the gullies on the mountain slopes at the back of the town, and took a large number. This stinging-nettle upon which the larvæ were feeding was taller and much more robust and bushy than our common English plant, and its stinging powers about twice as severe. The habits of the larvæ were much the same as those of *P. atalanta*, as was also their general appearance. I also caught three fresh butterflies, evidently just emerged, and observed worn females engaged egg-laying, so there was probably a succession of broods during the summer. Subsequently a number of the perfect insects were bred, and I did not find that any of the larvæ or pupæ had been attacked by parasites. On March 9th, 1883, the first time I ever saw *P. gonerilla* alive, I took three fine specimens in the Botanical Gardens, Wellington, where I found them feasting on the sweet-smelling flowers of a kind of privet. It is a beautiful insect when seen with its wings fully expanded in the bright sun.

The larvæ of *Pyrameis itea*, Fabr., were very common at Hobart, Tasmania, in February, 1883, and I took a number from beds of nettles in various parts of the town and its outskirts, and bred many of the butterflies, but did not notice any sign of ichneumons. It also occurred in Australia, where I saw larvæ commonly in the neighbourhood of Sydney, as well as at Blackheath, on the Blue Mountains, in February, 1885.

Another *Vanessid*, *Junonia vellida*, Fabr., was common in Australia, and upon all the islands in the Pacific that I visited. Its habits much resemble those of *A. urticae*. Near Sydney I found the larvæ feeding on *Plantago major* and *P. lanceolata*, as well as upon *Antirrhinum*, in the Botanical Gardens. At the Friendly Islands they fed on sweet potato and on other islands they were to be met with feeding, quite exposed, on the leaves of a kind of *Daphne*. I bred a large number of the butterflies, but did not notice that any of the larvæ or pupæ were "stung."

Dovercourt;
November 23rd, 1921.

NOTES AND OBSERVATIONS.

CORRECTION OF A GENERIC NAME.—In my 'Exotic Microlepidoptera,' vol. ii, p. 456, issued in November, 1921, I described a new genus of *Cosmopterygidae* under the name *Mothonica*, unaccountably forgetting Lord Walsingham's use of the same name for a genus of *Xyloryctidae* (probably a synonym of *Stenoma*). I now propose to substitute for my genus the name *Mothonodes*.—E. MEYRICK; Thornhanger, Marlborough, November 24th.

NEW NAME FOR A FOSSIL TIPULID FLY.—By an unfortunate oversight I have given the name *Dicranomyia excavata* to a Gurnet Bay fossil in 'Ann. and Mag. Nat. Hist.,' June, 1921, p. 458, when the same name had been applied to a different species in 'Entomologist,' May, 1921. The later (June), *D. excavata*, may be renamed *D. exhumata*, n.n.—T. D. A. COCKERELL.

PIERIS RAPÆ, L., IN DECEMBER.—My daughter, Miss G. M. Haines, brought in, yesterday afternoon, a specimen of *Pieris rapæ*, L., which she found settled on a blade of grass in this village. The specimen is a very small male and appears newly emerged. It is somewhat more strongly marked than the paler specimens of the usual spring brood, but much more lightly than normal summer specimens. The apical blotch of the fore wings is quite distinct, but palish, as in the rather faint central spot. A very pale, rather linear suffusion is present before the apex on the costal border of the hind wings. The weather is still very mild, and the insect might represent, after such a phenomenal season, a fourth brood of the species!—F. H. HAINES; Brookside, Winfrith, Dorset, December 9th, 1921.

COLIAS EDUSA AND SOME OTHER SPECIES AT EASTBOURNE.—All through the past glorious summer, with its brilliant sunshine and undue share of easterly and south-easterly gentle breezes, we have been on the look-out for *Colias edusa*, but it was not until so late a date as October 26th that it came under our notice. On that morning, as I strolled on the Parade between 9 and 10 o'clock, I noticed a yellow butterfly feasting at a blossom of red valerian, and on approaching nearer to it found that it was without doubt *edusa*, but before I had time to examine it closely it flew up over the top of the bank and away inland, but from the glance that I got I judged it to be somewhat faded in colour. An hour or two later on the same morning I came upon another some mile or so further along the coast in one of the hollows under the Downs. This I was able to examine carefully and found it to be a female, without a chip in its wings, but undoubtedly much faded as though it had travelled a considerable distance. Although the weather continued fine for nearly a fortnight longer no other specimens of this species were seen. Other species that frequent our sea-front and its adjacent gardens have been remarkable rather for the late dates to which some of them have lingered with us than for their abundance at any time during the summer. Of the Vanessids, for instance, *Pyrameis (Cynthia) cardui* was first seen on July 1st, but not again until September 25th, from which date it occurred sparingly until the last week in October, when it became quite numerous for a few days, the last, a single individual, being met with on November 7th. *Pyrameis atalanta* was noted on July 30th, a single specimen, then from the end of September until October 30th, when it was last seen, was of almost daily occurrence, but only to the extent of some two or three individuals in a day. It appears to have been somewhat commoner a few miles inland, and I may mention in passing that when I was at Latchford, on the Cheshire border, on September 3rd it was there very abundant, a score or more frequently feeding at the blossoms of a *Buddleia*, of which shrub several fine specimens were growing in the garden that I was

visiting. *Aglais urticae* has been quite a rarity. *Pieris brassicae* was at no time sufficiently common to cause any serious anxiety as to our cabbages, and *P. rapae*, although for a week or so towards the end of July looking like becoming too numerous, soon died down, and had disappeared altogether by October 10th. *Pararge megæra* has thrown three fairly well-defined broods, the first appearing on May 2nd and continuing throughout that month. The second and most numerous was out from July 22nd until about August 20th, and a small third brood from September 29th to October 7th, which was the last date on which the species was noted. *Chrysosphanus phlæus* has produced certainly three and possibly four broods during the season. From May 1st to 16th it was frequently met with; then came a gap until July 3rd, from which date to the end of the month it was common. A few were seen about the middle of August, but whether stragglers from the earlier brood or a small third one it is difficult to say, but from September 29th to October 11th it was again common. Three or four species should, however, be mentioned on account of their great abundance. Round about the end of May and first week or so in June *Cupido minimus* occurred in greater numbers and over a wider area than I have before met with that species, even invading the Parades and our gardens. In the middle of July *Epinephele jurtina* rose from the long grass of the hollows of the Downs in numbers in the evening at every step as one walked through it, and at the same time practically every knapweed head was seething with *Zygana filipendulae*, a single head frequently having half a dozen individuals upon it. During the latter half of October *Plusia gamma*, which species by the way had been fairly common in June, suddenly became very abundant about the middle of October, swarming about the red valerian blossoms in vast numbers both by day and night, and so continued until the end of the month. It was last seen out of doors on November 7th, but an individual insisted upon buzzing about the house as soon as the lights were turned on until the evening of the 10th.—ROBERT ADKIN; Eastbourne, December, 1921.

COLIAS HYALE IN KENT AND C. EDUSA IN DORSET.—*C. hyale* was common this year in the Ashford district, notably more so than at Folkestone. The insect favoured lucerne fields in preference to clover, especially in spots where it was protected from a rather cold south-east wind which was blowing during the month of August. My first specimens were taken on July 31st, and the last on August 26th. White females were fairly common, especially towards the end of August. *C. edusa* was conspicuous for its absence. The latter, however, was fairly abundant at Weymouth during the first fortnight in October. I believed many of these to have belonged to a second brood.—E. SCOTT, M.B.; Hayesbank, Ashford, Kent.

PYRAMEIS CARDUI IN NORTH LANCASHIRE AND WESTMORLAND.—The following occurrences of *Pyrameis cardui* may possibly be worth recording as I have not seen the species before in the following localities: High Carley, near Ulverston, Lancashire—a female—September 19th, 1921. Another specimen at Elswick, in the Fylde, September, 1921. Two specimens in a garden at Bowness-on-

Windermere, Westmorland, September 18th, 1921.—G. LISSANT COX; Preston.

THIRD BROOD OF PARARGE MEGÆRA AND COLIAS EDUSA IN HANTS.—With reference to the Rev. Gilbert H. Raynor's remarks ('Entom., vol. liv, p. 269) on the third brood of this species, I should like to place on record its occurrence as late as the last week of October and first of November on low cliffs facing the sea, between Milford-on-Sea and the Hurst Castle marshes, South Hants, in prime condition, of normal size, very active and elusive on the wing, and hardly resting for a moment. At the same time and place *Colias edusa* was likewise to be seen, with, however, somewhat changed methods of flight, fluttering, uncertainly and weakly, round bramble and other bushes, and could have been captured without any exertion or trouble. The specimens were equally fine. At Milford the weather conditions of this very remarkable autumn were abnormally mild and summerlike till November 7th, when, after a sudden furious storm of wind and rain, cold weather suddenly set in, with deep snow in some places and keen frost throughout England.—I. COSMO MELVILL; Meole Brace Hall, Shrewsbury.

SECOND BROODS OF NISONIADES TAGES AND CUPIDO MINIMUS.—Numerous examples of *Nisoniades (Thanaos) tages* were observed on the Downs here during the last few days of July. So far as my own observations were concerned I could not see that these specimens were in any way different from the normal spring ones. *Cupido (Zizera) minimus* occurred at the same time and place in abundance, although the early June emergence was quite scarce.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

LARVÆ OF SPHINX CONVULVULI IN HANTS.—On October 25th, whilst pulling mangolds in a field nearby, the worker found two larvæ which he brought to me, and which proved to be *S. convolvuli*. The field was searched over on subsequent days but *Convolvulus arvensis* was very scarce. On November 4th one other larva was found. Further search was not successful, and doubtless the cold weather and snow of the nights of the 7th and 8th destroyed both any other larvæ there may have been and what little remained of the withering food-plant. Each of the three larvæ is of a dark muddy sepia brown ground-colour, inconspicuously and minutely mottled with yellow dots. The face mask is blackish with three yellow stripes on either side with a shorter sub-triangular central stripe. There is a more or less conspicuous yellow sub-dorsal stripe on each side extending from the head to the fifth segment. From that point its position is indicated by a yellowish spot on the anterior portion of each segment from the sixth to the eleventh. These spots are not connected by any intermediate stripe. Below the spiracles, which are blackish in colour, there is an interrupted continuous bold whitish subspiracular line throughout the whole length. This line extends round the anal flap, at which point it is more yellow in colour. There are distinct oblique blackish side stripes on segments 5 to 11 and indications of a dorsal stripe on segments 2 and 3. The horn is black and shiny. The ventral area, legs and prolegs are dark, slightly shagreened with yellowish. When at rest the larva lies half curled with head parallel

to the 10th or 11th segment. The length of the two larvæ first found was about $3\frac{3}{4}$ in. The third larva was slightly smaller. This description of the larva when compared with the plate in Kirby's 'European Butterflies and Moths' does not give the impression that his illustration is true to life. It may be that the larva assumes the magnificent appearance as shown in the plate when fully grown, and that the larvæ found by me have yet to cast their skins for a final time. It agrees, however, well with the plate in Buckler's 'Larvæ,' vol. ii, except that the larvæ all showed a marked melanic tendency in harmony with the dark soil of the field where they were found. In years gone by *S. convolvuli* not infrequently was to be seen hovering over a bed of *Nicotiana affinis* in my garden, but this year no specimen was seen.—ALAN DRUITT; Willow Lodge, Christchurch.

[Since writing this note two of the larvæ have died. The third has been preserved as a cabinet specimen.—A. D.]

DEIOPEIA PULCHELLA AND STERRHA SACRARIA AT LULWORTH.—I wish to record my capture on October 11th of a fine fresh female specimen of *D. pulchella* and a fine fresh male specimen of *S. sacraria* on the cliffs near Lulworth. The moths were taken within a few yards of one another. It was a cold day and there was a strong breeze blowing from the sea. On this account I presume that they were likely to be migrants.—E. SCOTT, M.B.; Hayesbank, Ashford, Kent.

ORRHODIA ERYTHROCEPHALA, ETC., NEAR EASTBOURNE.—This species turned up again on October 29th on the same sugaring round and within about forty yards of the spot where I took one in November, 1913. It is the *glabra* form and in very good condition. I have tried twice since but the evenings were unsuitable. Ivy bloom has been the best method of collecting here this autumn. Although insects were not at all numerous the first week in October I took twelve *Xylina semibrunea*, two on the 1st, one on the 5th, and on the 4th, 6th and 8th three each evening, all in fine condition. The bloom was nearly over when I went with a friend on the 10th, but on the only clump we were able to search before a heavy storm drove us home the insects were far more numerous than on any previous occasion, but I am still waiting for the evening when "every bunch of blossom has three or four occupants."—EDWIN P. SHARP; 1, Bedfordwell Road, Eastbourne.

ORRHODIA ERYTHROCEPHALA GLABRA AT EASTBOURNE.—At the suggestion of Mr. E. P. Sharp I am writing to inform you that I was fortunate enough to capture a specimen of *Orrhodia erythrocephala* ab. *glabra* at sugar on November 24th within a short distance of the spot where Mr. Sharp made his capture.—S. A. CHARTRES; 4, King's Drive, Eastbourne, December 14th, 1921.

ACONTIA LUCTUOSA AT SUGAR.—In glancing through my entomological diary for the past season, I am reminded of a somewhat phenomenal occurrence which I thought might be worth recording in the 'Entomologist.' This was the capture of two examples of *A. luctuosa* from sugar patches quite late in the evening, viz. 10 p.m. The exact date was July 27th, the evening of which was not a

particularly favourable one for sugaring in consequence of the exposed situation chosen (a row of posts on an almost bare hillside), and upon which the rays of an almost full moon were directed. One of the moths taken flew off from the sugar as I approached and the net had to be brought into action for its capture. The thought has occurred to me that possibly the bright moonlight may have been in some way responsible for the late activities of this usually sun-loving species. It would be interesting to know if other readers have observed this unusual habit in *luctuosa*.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

THALPOCHARES (MICRA) PARVA.—Whilst searching ivy here at 9 p.m. on November 1st, 1921, I took a good specimen of *T. parva* at rest on an ivy leaf immediately below an ivy bloom on which it had most probably fed. It sat with wings depressed after the fashion of *Pionea forficaris* and *Margarodes unionalis*, and was very active when the "closure" was applied. Mr. J. W. Metcalfe, with his usual kindness, has verified my capture. Several *Noctuæ* were observed taking long and rapid flights in the bright October sunshine. Most of them appeared to be *Agrotids*, but one that was netted proved to be a male *Aporophylla nigra*. Autumn "sugar" was a failure.—P. P. MILMAN; Cyprina, Lower Conway Road, Paignton.

NOTES ON BUTTERFLIES FROM THE BUCKS CHILTERN, 1921.—Generally speaking butterflies were abundant on the hills. The spring broods all appeared early, and were perhaps only normal in numbers, but the unbroken hot dry weather from May to July was favourable to larvæ, etc., and second and third broods of some species were very plentiful. I saw no evidence of scarcity of food-plants adversely affecting any species; the chief effect of the drought seemed to be the unusual rapidity with which insects became worn. It was difficult to get "cabinet" specimens a fortnight after emergence—such was my experience, at any rate. The following notes on certain species from one area may be of interest: *Pieris rapæ*, perfectly fresh specimens taken in September suggest a third emergence. *Gonepteryx rhamni* (July 14th); *Vanessa io* (July 11th), *Aglais urticæ* (July 3rd), *Pyrameis atalanta* (July 3rd), a fair number about for two or three weeks subsequent to these dates, then altogether disappeared. *P. cardui*, only worn insects seen, early in July. *Dryas paphia*, first seen June 26th, fairly common in several woods. *Brenthis euphrosyne*, common and well distributed. *Melanargia galatæa*, emerged about June 22nd, abundant in certain localities. *Pararge megæra*, fairly common in May and August though rather local. *P. egeria*, var. *egerides*, four broods occurred, and the butterfly was common in most woods all the season. Emergences approximately as follows: (1) middle of April, (2) June 10th, (3) July 25th, (4) first week in September. The females of the spring brood are an unusually yellow form, I think. Fourth brood males very dark; one taken has all yellow obsolete except for two small spots towards tip of fore wings. *Zephyrus quercus*, *Thecla w-album*, very local. *Chrysophanus phlæas*, spring brood rather scarce, second and third plentiful. The last emerged early in September. *Polyommatus icarus*, three emergences, May 12th, July 16th and September 1st.

Second and third broods abundant, var. *cærulea* frequent. Females of last brood often very dark. *Cupido minimus*, emerged May 12th. Plentiful in many places; a partial second brood in August. *Celastrina argiolus*, very scarce in the spring, and by no means common in July and August. *Agriades corydon*, emerged about July 20th. Not so plentiful as might have been expected this summer; females mostly typical. *Nemeobius lucina*, very local.—S. B. HODGSON; 3, Bassett Road, North Kensington, W.

LEPIDOPTERA TAKEN OR BRED FROM LARVÆ AND PUPÆ FOUND IN THE GARDEN AT 3, LITTLE DEAN'S YARD, WESTMINSTER.—Said garden measures about 84 feet by 36 feet. Rhopalocera: *Pieris brassicæ*, *Pieris rapæ*. Heterocera: *Dilina* (*Mimas*) *tiliæ*, *Phalera bucephala*, *Orgyia antiqua*, *Spilosoma menthastri*, *Spilosoma lubricipeda*, *Acronycta psi*, *Noctua primulæ*, *Axylia putris*, *Triphæna* (*Agrotis*) *comes*, *Triphæna* (*Agrotis*) *pronuba*, *Barathra brassicæ*, *Mamestra oleracea*, *Euplexia lucipara*, *Phlogophora meticulosa*, *Mormo maura*, *Nenia typica*, *Caradrina taraxaci*, *Caradrina quadripunctata*, *Amphipyra pyramidea*, *Calymnia affinis*, *Amathes* (*Orthosia*) *lota*, *Plusia gamma*, *Abrostola triplasia*. *Xanthorhoë fluctuata*, *Eupithecia oblongata*, *Eupithecia vulgata*, *Abraxas grossulariata*, *Ennomos quercinaria*, *Selenia bilunaria*, var. *juliaria*, *Oura-ptyx sambucaria*, *Hybernia defoliaria*, *Lycia hirtaria*, *Hemerophila* (*Synopsis*) *abruptaria*, *Boarmia rhomboidaria*.—(Rev.) A. G. S. RAYNOR, 3, Little Dean's Yard, Westminster.

A FORTNIGHT IN CARNARVONSHIRE.—We—that is, my friend Mr. E. D. Bostock and myself—started on September 1st for a fortnight's pursuit of Lepidoptera at Abersoch, a village on the coast seven miles west of Pwllheli. The first object of our expedition was to search for the larvæ of *Dianthæcia barrettii*, the imago of which I had taken there in 1897 and 1899 ('Entom.' vols. xxx and xxxii), but though we examined hundreds of plants of *Silene maritima* not a trace of the larva could we find. During the first week the weather was warm and sunny, and butterflies were numerous. *Pieris brassicæ* and *P. rapæ* were common, and *Pyrameis atalanta* abundant on the purple flowers of a large species of Veronica. *P. cardui* also was fairly common, but seemed to prefer the flowers of heather to the Veronica, though it visited both. *Vanessa urticæ* in fair numbers was in good condition, possibly a third brood. Worn specimens of the second brood of *Lycæna icarus* were numerous on the sandhills, where were also many *Cænonympha pamphilus*, some in quite fresh condition, and a third brood of *Chrysophanus phlæas* was beginning to appear. Five specimens of *Colias edusa* were seen, but their flight was too rapid for capture. On the sandhills at Port Nigel, which we visited one day, we found a few specimens in fair condition of a second brood of *Brenthis selene*, and saw a worn female of *Argynnis aglaia*. On the sandhills at Abersoch there were a few wooden posts still standing, the remains of what had once been a fence enclosing a large square. On these we put sugar every night, and to it moths came freely. The most abundant visitors were *Agrotis vestigialis*, *Noctua xanthographa* and *Phlogophora meticulosa*, and in smaller numbers were *Agrotis segetum*, *A. exclamationis* and *A. upsilon*,

Noctua glareosa, *N. c-nigrum* and *N. plecta*, *Triphaena pronuba* and *T. comes*, *Xylophasia monoglypha*, *Leucania littoralis* (these last evidently from their condition and small size a second brood), and *Apamea secalis*. Occasional visitors were *Stilbia anomala*, *Hypenodes costæstrigalis*, *Aporophyla lichenea*, *A. nigra* and *A. lunosa*. On September 8th *A. lutulenta* appeared, and continued to come in increasing numbers until the day of our departure (September 15th), and altogether we took over thirty specimens. None of them were of the ordinary English brown form, but all were ab. *luneburgensis* or ab. *sedii*. The occurrence in this locality of these forms of *A. lutulenta*, of *D. barrettii* of the brown Howth form, together with that of the *Zygæna pilosellæ*, is extremely interesting. The abnormality of the season is well shown by the second broods of three species usually only single-brooded on this side of the English Channel, namely *B. selene*, *A. exclamationis* and *L. littoralis*.—F. C. WOODFORDE; Oxford.

CRICKETS AND REFUSE DUMPS.—With reference to Mr. Campion's note (p. 246), I can put on record that last autumn crickets were plentiful and very noisy about 3 p.m. on two Saturday afternoons on the edge of a large dump between Kew and Mortlake. I have not come across my notes on the occurrence, so cannot just now say the exact dates, but I see from my pocket diary that I passed the spot on October 2nd and 9th, and again on November 6th and 20th. Probably the two former dates would be the ones. November 20th was at the beginning of the cold spell we had last winter; so can be ruled out. The dump faced south, and was composed of household refuse, ashes and old tins, flanked by a mass of old cabbage and Brussels sprouts stalks, amongst which were the crickets. Then, again, on October 1st this year, near Grays, Essex, we found crickets plentiful on the sea-wall between the stones, and further on the edge of a refuse dump, mostly ashes. Both these dumps were smouldering in places, so there would be extra temperature beyond that derived from the sun's rays, this being similar to the case mentioned by Mr. Campion.—H. J. BURKILL; 79, Cornhill, E.C. 3.

SOCIETIES.


THE ENTOMOLOGICAL SOCIETY OF LONDON.—November 16th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The Secretary announced that the Council had nominated the following Officers and Council for 1922: President: The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc. Treasurer: W. G. Sheldon, F.Z.S. Secretaries: Messrs. S. A. Neave, M.A., D.Sc., F.Z.S., H. Eltringham, M.A., D.Sc., F.Z.S. Librarian: H. J. Turner. Council: Messrs. Robert Adkin, H. E. Andrewes, Ernest C. Bedwell, James E. Collin, F.Z.S., J. Davidson, D.Sc., F.L.S., J. J. Joicey, F.L.S., F.Z.S., F.R.G.S., etc., Frederick Laing, William G. F. Nelson, Prof. E. B. Poulton, M.A., D.Sc., F.R.S., etc., Norman Denbigh Riley, H. Rowland-Brown, M.A., J. Waterston, D.Sc., B.D. After some discussion, it was decided to hold an informal meeting on January 4th, 1922, at 5.30 to 7.30 p.m.—*Exhibits*: Mr. W. J. Kaye,

a new race of the Ithomiine butterfly *Dircenna lenea*, from Trinidad, with a series of the typical forms from the Potaro district of British Guiana.—Mr. A. W. Bacot, enlarged microphotographs of the eggs of bed bugs.—Mr. W. G. Sheldon, Lepidoptera from Sutherlandshire.—Dr. A. E. Cockayne, an example of *Pyrameis atalanta* with larval head.—Prof. E. B. Poulton, F.R.S., discussed the question of fluorescence as evidence for the evolution of the pigments of mimetic females from those of their non-mimetic males, and said that with the help of Dr. Cockayne, he had been able to examine for fluorescence the Nairobi forms of *Papilio dardanus* that had been shown by Canon StA. Rogers at the last meeting.—Mr. H. Donisthorpe, specimens of the Chalcid, *Spalangia erythromera*, together with its Dipterous host, and the ant *Acanthomyops fuliginosus* in the nest of which these insects live.—Dr. Neave read a translation from the German of an amusing skit on modern systems of zoological nomenclature.

December 7th, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The Secretary again read the list of nominations of officers and council for the ensuing year, and said that he had not received any alternative names.—The following were elected Fellows of the Society: Messrs. W. Bevan Whitney, B.Sc., A.M.Inst.C.E., "Glen Doone," Gerrards Cross, Bucks; Edward Nevill Wilmer, Trafford Hall, near Chester, and Corpus Christi College, Oxford; and John Glover Hugo Frew, M.Sc., 262, Church Road, Yardley, Birmingham, and Rothamsted Experimental Station, Harpenden.—The Secretary expressed the hope that the informal meeting to be held on January 4th, 1922, between 5.30–7.30 p.m., would be well attended, and said that Dr. Cockayne had kindly offered to show the effect of fluorescence on butterflies—an exhibit which would be of great interest to Fellows.—Prof. H. Maxwell-Lefroy, on behalf of Dr. A. Moore, a new method of preserving insects.—Mr. G. Talbot discussed the existence in Africa of a remarkable *Papilio* of the *antimachus* group, and also exhibited, on behalf of Mr. J. J. Joicey, a gynandromorphous example of *Argynnis hyperbius castesti*.—Mr. R. Adkin brought for exhibition a series of *Aglais urticae*; this exhibit gave rise to some discussion on the comparative rarity of *A. urticae* in 1921, and on the relative abundance and apparent spread in the South of England of *Vanessa c-album*.—Mr. W. J. Kaye, *Heliconius* from Trinidad, and a remarkable Erycinid, *Nymphidium maravalica*, with its supposed model, *Adelpha iphiclea*.—Prof. Poulton, black varieties of the Longicorn beetle, *Gramoptera analis*, on behalf of Mr. Joseph Collins; he also gave an account of some observations of Mr. A. H. Hamm on the third brood of *Heodes phlaeas* from the Newbury district in 1921, and exhibited the specimens referred to.—Mr. R. Stenton, some living Mantids bred from an egg-case taken by Mr. J. C. F. Fryer on an imported Japanese maple.—The following papers were read: "Descriptions of South American Micro-Lepidoptera," by Mr. E. Meyrick, B.A., F.R.S., F.Z.S. "Notes on Orthoptera in the British Museum; Group II, *Calliptamini*," by Mr. B. Uvarov.—Mr. C. Nicholson read some notes on *Vespidæ*, and on a remarkable nest of *Vespa vulgaris*, illustrated with lantern-slides.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

 NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each

Duplicates.—Pupæ: *S. ocellatus*. Imagos: *Ocellatus*,* *Tipuliformis*, *B. quercus** (very fine, 4 ♀, 1 ♂), *Nupta*, *Maura*, *Moneta*, *Flavocincta*, *Palleus*, *Matura*, *Puta*, *Xanthographa* (various), *Pyramidea*, *Prunaria* ♂ (3), *A. promutata* (2), *Tersata* (second brood), *Decolorata* (4). *Desiderata.*—*Procellus*, *Promissa*, *Sponsa*, *Fuciformis*, *Bombyliformis*, *Crabroniformis*, *Apiformis*, and local Northern species. Black pins, full data and good condition only.—*Herbert Wm. Baker*, 26, *Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk*.

Duplicates.—*Selene*, *T. rubi*, *Blandina* ♂, *Rumicis** and var., *Salicis*,* *Chi*, var. *Olivacea*, *Glaucæ*,* *Pedaria** (melanic), *Luteata*, *Leucophearia* and var., *Carpinata*,* *Tristata*, *Testata*,* *Atrata*, etc. *Desiderata.*—Very numerous to renew and extend.—*G. Fleming*, 26, *West Grove, Merthyr Tydfil*.

Duplicates.—Ova: *Olivacea*, *Pennaria*, *Angularia*. Pupæ: *Innotata*, *Bidentata*, *Dromedarius*. *Wanted.*—Ova: *Tiliaria*, *Erosaria*. Pupæ: *Crepuscularia*, *Biundularia*, *Rivata*, *Galiata*. Imagines: "pugs," *Immanata*, *Grossulariata* varieties, *Miata*, *Siterata*, *Salicata*, *Olivata*, *Picata*, *Munitata*, *Nigrofasciaria*, *Firmata*.—*H. H. Harrison*, *The Avenue, Birtley S.O., Co. Durham*.

Duplicates.—*M. captiuncula*, *E. congelatella*, *P. varieagana* (white var.), *Sauciana*, *Brunnichiana*, *Semifuscana* (6), *Occultana*, *Schulziana*, *Dorsana*, *Biarcuana*, *Nanana*, *Vacciniana*, *Strobilella*, *Incarnatana* (4), *Dimidiana*,* *Badiana*, *Baummanniana*, *D. salicella* (4), *Bertrami*, *T. corticella*, *Nervosa*, etc. *Desiderata.*—*Pyrales*, *Tortrices*, etc.—*T. Ashton Lofthouse, The Croft, Linthorpe, Middlesbrough*.

Duplicates.—*Bicolorana*, *Convolvuli*, *Menyanthidis*, *Dictæoides*, *Interrogationis*, *Thalassina*, *Cratægi* ♂, *Triplasia*, *Tincta* (fair), *Alternata*, *Mendica*, *Nupta*, *Urticæ*, *Atalanta*. *Desiderata.*—*C. album*, summer brood only, with data.—*B. W. Neave*, *Lyndhurst, 95, Queen's Road, Brownswood Park, London, N. 4*.

Duplicates.—*Selene*, *Sibylla* (fine), *Galatea*, *T. rubi*, *Ægon*, *Corydon*, *Actæon*, *Hectus*, *Populata*, *Viretata* (fine), *Multistrigaria*, *Fimbria*, *Ambigua*, etc., etc. *Desiderata.*—*Depuncta*, *Populeti*, and very numerous to replace; first-rate condition only.—*W. C. Wells*, 354, *Boldmere Road, Erdington, Birmingham*.

OBITUARY.—With very great regret we have to announce that Dr. Chapman passed from among us on December 17th. A detailed notice will appear in our February issue.

To CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-BURY, N.W. 2.

FOR SALE.—Nearly every species of British Macro-Lepidoptera on hand, including local forms, all in perfect condition and at lowest possible prices. Also many pupæ, none inbred. Lists now ready.

A. J. SPILLER, Chinnor, Wallingford.

CONTENTS.

- A Synopsis of British Proctotrypidæ (Oxyura), *Claude Morley, F.E.S., F.Z.S., etc.*, 1. Notes on British Odonata in 1920, *W. J. Lucas, B.A., F.E.S.*, 4. Notes on the Lepidoptera of Glen Fender, Perthshire, and Invershin, Sutherlandshire, *The late F. G. Whittle, F.E.S.*, 10. Some Notes on the Collection of British Macro-Lepidoptera in the Hope Department of the Oxford University Museum, *F. C. Woodforde, B.A. F.E.S. (continued from vol. liv, p. 289)*, 12. Notes on *Vanessid* Larvæ, *Paymaster-in-Chief Gervase F. Mathew, R.N., F.L.S. F.E.S.*, 14.
- NOTES AND OBSERVATIONS.—Correction of a Generic Name, *E. Meyrick*, 16. New Name for a Fossil Tipulid Fly, *T. D. A. Cockerell*, 17. *Pieris rapæ*, L., in December, *F. H. Haines*, 17. *Colias edusa* and some other Species at Eastbourne, *Robert Adkin*, 17. *Colias hyale* in Kent and *C. edusa* in Dorset, *E. Scott, M.B.*, 18. *Pyrameis cardui* in North Lancashire and Westmorland, *G. Lissant Cox*, 18. Third Brood of *Pararge megæra* and *Colias edusa* in Hants, *I. Cosmo Melvill*, 19. Second Broods of *Nisoniades tages* and *Cupida minimus*, *A. T. Postans*, 19. Larvæ of *Sphinx convolvuli* in Hants, *Alan Drutt*, 19. *Deiopeia pulchella* and *Sterrhæa sacraria* at Lulworth, *E. Scott, M.B.*, 20. *Orrhodia erythrocephala*, etc., near Eastbourne, *Edwin P. Sharp*, 20. *Orrhodia erythrocephala glabra* at Eastbourne, *S. A. Chartres*, 20. *Acontia luctuosa* at Sugar, *A. T. Postans*, 20. *Thalpochares (micra) parva*, *P. P. Milman*, 21. Notes on Butterflies from the Bucks Chilterns, 1921, *S. B. Hodgson*, 21. Lepidoptera Taken or Bred from Larvæ and Pupæ found in the Garden at 3, Little Dean's Yard, Westminster, (*Rev.*) *A. G. S. Raynor*, 22. A Fortnight in Carnarvonshire, *F. C. Woodforde*, 22. Crickets and Refuse Dumps, *H. J. Burkill*, 23.
- SOCIETIES.—The Entomological Society of London, 23.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.

Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11,

Vol. LV.]

FEBRUARY, 1922.

[No. 705.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY

EDITED BY RICHARD SOUTH, F.R.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

W. L. DISTANT, F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Double Number.

Price Two Shillings and Sixpence Net.



WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

THE MACROLEPIDOPTERA OF THE WORLD.

By **PROF. AD. SEITZ, Ph.D.**

The publisher begs to announce that the Palearctic section has appeared complete in 130 parts, the Exotic section has reached the 221st part; the continuance of the following parts is assured.

For further particulars please apply direct to the publisher, **ALFRED KERNEN**, Stuttgart, Poststr. 7.

WANTED AT ONCE.—Hundreds of *Lycæna belargus* ♂, *Corydon* ♂, *Euchloe cardamines* ♂, and *Vanessa io* ♂ or ♀. Also a few *Thecla rubi* and *Lyc. arion*. Will give cash or exchange. Can offer Californian or Tropical Butterflies. Dealers or collectors of butterflies in India, Java, Oceania, etc., please send list of showy butterflies.

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

THE ENTOMOLOGIST.

VOL. LV.]

FEBRUARY, 1922.

[No. 705

THE GENUS "*AMBLYPODIA*" *AUCTORUM* (DE NICEVILLE, MOORE, SWINHOE, ETC.), *NEC* HORSFIELD (LEP. RHOP.).

BY N. D. RILEY, F.E.S., F.Z.S.

THE generic name *Amblypodia* was proposed by Horsfield ('Cat. Lep.,' E.I.C., p. 98, 1829) for a large number of species of Lycænidae, divided into five sections. viz.: (1) *Narada*; (2) *vivarna*; (3) *apidanus*, *centaurus*, *helus*, *eumolphus*; (4) *phocides*; (5) *vulcanus*, *lohita*, *syama* and some others. On p. 111 of the same work he states that he considers the species of the third section to be typical of the genus. The type of the genus must therefore be one of the species included in the third section, and Boisduval's action in 1870, specifying *narada* as the type, cannot be accepted. The type was finally fixed by Scudder in 1875, who specified *apidanus* as the type. His action was perfectly correct, and must be upheld. *Amblypodia* must therefore supersede *Arhopala* as at present used, and I propose the name *Horsfieldia*, n.n., to replace the *Amblypodia* of modern authors, with *narada*, Horsf., as the type of the genus.

Since the appearance of Bethune-Baker's excellent 'Monograph of the Amblypodia Group' little has been done with this rather obscure genus. The life-history of one of the species (*H. anita*, Hew.) has been admirably described by T. R. Bell in the 'Journal of the Bombay Nat. Hist. Soc.,' xxvi, p. 444, and that of the other (*H. narada*, Horsf.) less fully by Snellen in 'Rhop. Java, Lycænidae,' p. 63, 1918; and the various races of the species hopelessly confused by Frühstorfer in a paper in the 'Ent. Zeits.' (Stuttgart), xxi, p. 150, 1907.

As the latter paper is very misleading and also very little known, the following summary of the species and their named forms would appear to be necessary.

The genus, so far as is known, is composed of three species, separated as follows:

Males.

- A. Upper side fore wing, purple with a narrow even black border *anita*.
- B. Upper side fore wing, brilliant blue.
 - a. Black border narrow on costa and posterior portion of hind margin, broad at apex *narada*.

- b.* Black border very broad, occupying more than half the wing surface.
 - a'.* Lower teeth at extremity of clasper strong, well separated, the ventral edge of clasper concave centrally *narada.*
 - b'.* Same teeth small, close together, ventral edge of clasper nowhere concave *annetta.*

Females.

- A.* With blue (or purple) markings on fore wing only, or none at all *anita.*
- B.* With blue (or purple) markings on both wings.
 - a.* The outer edge of blue on fore wing conforming to the contour of the hind margin, or, if not, then only of small extent *anita.*
 - b.* Outer edge converging markedly with hind margin towards inner angle; if only of small extent then very much longer posteriorly than anteriorly *narada.*
 - c.* The blue of approximately the same extent on both wings, barely extending more than half-way from base to hind margin *annetta.*

The males in this genus fall very readily into three well-defined groups, according to their genitalia. Individual variation of these parts, however, is considerable, and seasonal variation seems also to occur; in a typical "wet" male from Ceylon the teeth at the extremity of the claspers are not nearly so strongly developed as are those of a "dry" male, with red underside, from the same locality. The claspers in all three species are only strongly chitinated outwardly, ventrally and towards the base for a short distance from the extremity, the bulk of the inner and dorsal surfaces being only membranous. In all three the distal edge is characterised by having two large teeth, one above the other, and a series of smaller ones above these. *Anita* and *annetta* are very similar as to the arrangement of these teeth, but *annetta* has the lower two the more delicate, shorter in relation to the length of the whole clasper, and with the lowest arising sooner than in *anita*, the remainder not directed upwards to such an extent. *Narada* is separable at once from either of the others by the size and different arrangement of these two main teeth, and by the constriction of the clasper about the middle.

(1) *HORSFIELDIA ANITA*, Hew.

This species is only poorly and somewhat doubtfully separable into local races, the differentiation of which is not very advanced.

(a) *H. anita naradoides*, Moore.

Confined to Ceylon. Although I have examined some forty examples of this race, I cannot find any definite character on which to separate it from Indian specimens. It is, however, *on the average* considerably larger and somewhat darker. The typical female has a large blue (or purple) patch on the fore wing, and occasionally a trace of blue about the bases of veins 3 and 4 on the hind wing above; the ♀-f. *darana*, Moore, has the blue area replaced by a brown of markedly lighter shade than the rest of the wing, and occasionally a little blue scaling centrally in area 1 *a* of fore wing above.

(b) *H. anita anita*, Hew.

Amblypodia narada dina, Frühst., *op. cit.*, p. 150.

Amblypodia arracana, Grose-Smith, A.M.N.H. (5), xx, p. 268.

Amblypodia narada, Swinhoe, Lep. Ind., viii, p. 136.

Extends from the Nilgiris to Khandala and across to Bengal, Darjeeling, Assam, Burma and Siam, and possibly to Malacca.

Hewitson's type is a small, bright purple specimen, with a moderate black border and a red underside; it came from Siam. One example in the British Museum from Darjeeling (Elwes Coll.) agrees remarkably well with the description of *arracana*. Burmese specimens are usually very pale above and below, and have only a very narrow black border on the upperside; they have an extremely "dry" appearance. Specimens from Madras and the Nilgiris have markedly pale cilia, the males rather pale above, pale reddish buff below, the females generally very light. From Kanara specimens are usually small, rather dark, the black border in the male comparatively broad; the females similar to *naradoides*, or the blue may be entirely absent or very much reduced.

Should these slight differences prove to be constant in their respective areas (which hardly seems probable), then *dina* should be restricted to the race from Madras and the Nilgiris, *arracana* be applied to the Darjeeling and Assam race, *anita* to the Siam and Malay Peninsula form, leaving the Kanara and Burmese races to be named.

(c) *H. anita orla*, Frühst.

The Javan race. Frühstorfer bases his description on four females. He confuses *anita* and *narada* throughout, and the description might apply to either; but since he separates it from typical *narada* (described from Java), the probability is that it refers to *anita*. A pair in the British Museum are characterised by their very dark and uniform undersides, the diagonal "mid-

rib" line being almost entirely obscured in the male, faintly present in the female.

(d) *H. anita andamanica*, ssp. nov.

Readily distinguished from *A. anita* in the male by the more bluish coloration of the upperside and the very dark underside; in the female by the larger bright blue area of the fore wing and the repetition of the same colour over a large area centrally on the hind wing. On the underside of the female there seem to be no distinguishing features.

B.M. Types No. Rh. 201 ♂, 202 ♀, Andamans (*ex* Hewitson Coll.).

Confined to the Andamans.

This race has been variously regarded as *erichsoni*, *narada* or *anita* by different authors. The genitalia of the male prove it to belong to *anita*.

(e) *H. anita hainana*, Crowley.

The largest and most brilliant race of *anita*, only known from the type specimen in the British Museum. The genitalia prove it to belong to *anita*.

(2) *HORSFIELDIA NARADA*, Horsf.

(a) *H. n. taozana*, Moore.

The upperside in the male is very brilliant blue, and the black marginal band is about 2 mm. wide at the inner angle, 5 mm. in area 5. The underside varies from reddish to dark purplish brown.

Occurs in Burmah and Tennasserim, Malacca and E. Sumatra.

(b) *H. n. fara*, Frühst.

Frühstorfer describes this as "larger, with rounder wings than Javan examples, male of a more intense and brilliant blue than in *narada* [probably *narada narada* intended], female darker than *anita* from Pahang [*? narada taozana* intended]. Underside darker than in examples from the mainland and Java, with two prominently displayed whitish-grey submarginal bands on the hind wing." He then goes on to say that it occurs in two seasonal forms, one "with a violet suffusion and yellow-brown underside from N.E. Sumatra, dry season"; the other almost "sage-blue," whatever colour that may be, and violet-brown underside. What I assume to be the latter is the only form I have seen. It comes from Nias, and also apparently from W. Sumatra.

(c) *H. n. narada*, Horsf.

This is the smallest and least brilliant race, and is confined to Java. The black border in the male is not nearly so narrowed posteriorly as in the preceding subspecies, and is more even. The female type has the blue scaling on the hind wing extending in the form of rays along veins 2, 3 and 4 right to the margin.

(d) *H. n. salvia*, Frühst.

Described from N. Borneo. Frühstorfer describes it as having a much narrower black distal border to the fore wing than the preceding. The reverse is the case in all the specimens I have examined, but the inner edge of this border is a great deal more diffuse than in the subspecies mentioned so far, and the underside is very dull and uniform, even the hind wing submarginal bands being hardly discernible. Only known from N. Borneo.

(e) *H. n. erichsoni*, Felder.

Very similar to *salvia*, Frühst., above, but far less uniform on the underside. Of the two distal grey bands on the hind wing below, the inner is by far the more conspicuous. Originally described from Luzon, and said by Frühstorfer to come also from Palawan and Bazilan; I have only seen it from Luzon.

(f) *H. n. plateni*, ssp. nov.

♂. Differs from all the preceding races in that the distal black border occupies the whole of the area from costa to upper edge of cell, the whole of the apical area, areas 4 and 5 with the exception of a few scattered scales proximally, more than half of area 3, rather less than half of area 2, and is 3 mm. wide at its narrowest point in area 1*b*. In effect the border appears to occupy practically the whole of the distal half of the wing. On the hind wing the blue does not extend into area 6 at all. Underside dark, greenish, markings as in *erichsonii*.

B.M. Type No. Rh. 203, ♂; Davao, S.E. Mindanao (*Dr. Platen*), ex Godman & Salvin Coll.

The female (B.M. Type No. Rh. 204) from the same source is very dark above with only a trace of blue distally in the cell on the hind wing, and a large blue patch on the fore wing occupying the bulk of areas 1*a*, 1*b* and the cell, but only extending into area 2 in the form of a few scattered scales. The underside is smooth dull ochreous, the markings very fine and delicate.

Apparently confined to Mindanao.

(To be continued.)

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

BY W. G. SHELDON, F.Z.S., F.E.S.

PROBABLY as little is known of the lepidoptera of Sutherlandshire as of any county in Great Britain, and the Assynt district being situated in the extreme west, its nearest point some thirty miles from the railway, it almost necessarily follows that it is one of the least known of that extensive county.

The literature on the subject is very scanty. Unquestionably the most important notes I can find are contained in an excellent paper by Mr. F. C. Hanbury in the 'E. M. M.,' vol. xxxi, p. 1, but as Mr. Hanbury's time during his stay was largely taken up by botanical research, and the weather at the time of his visit being extremely unfavourable, with almost continuous rainfall, but few species of Lepidoptera were noted. There is also a short list of thirty-eight species by Dr. W. W. O. Beveridge in the 'Annals of Scottish Natural History,' vol. i, p. 172 (1892). These two papers are all the records I can trace, but I understand from Mr. R. Adkin that William Salvage spent the summer of 1894 in Assynt; there is, however, no record of the species he took further than reports by Mr. Adkin of specimens received from him in the 'Proceedings of the South London Entomological and Natural History Society' for the years 1894-5.

I fancy the late Dr. Buchanan White knew the district fairly well—more perhaps as a botanist than as an entomologist; but he does not appear to have published anything on either subject.

I had Assynt in my mind for many years, but it was not until 1920 that I was able to traverse the ground which had been so often thought of.

Perhaps before dealing with the Lepidoptera met with I had better describe the district, which is in certain respects quite one of the most remarkable in Britain.

If one examines the map of Scotland it is seen that the only railway in the county of Sutherland runs up the east coast, which for a few miles inland is comparatively well cultivated and wooded; but between this and the west coast, on which Assynt is situated, there is a stretch some thirty miles wide of bleak sterile mountains and moors, almost treeless, and except for an occasional shepherd's hut, and at wide intervals two or three inns, frequented almost entirely by trout and salmon fishermen, there is not a sign of human habitation.

It follows that the insect fauna of the west is extremely isolated from that of the rest of Britain. Probably this state

of isolation has existed for several hundreds of years at least, but not for more, at any rate to such an extent as at present.

The Highlands of Scotland are to-day very largely treeless; they were not always so. At the dawn of history we read of the Great Caledonian Forest, composed principally of Scotch fir (*Pinus sylvestris*) and silver birch (*Betula alba*), covering vast tracts of country now bare of trees. Isolated bits of this forest still remain, for instance, along the southern shore of Loch Rannoch, and in Glen Orchy. Apparently the principal cause of this depletion of timber was fire.

In almost any part of the Highlands, even up to 2000 ft. above the sea-level, if one looks at a section of the peat where it has been worn through by the action of water, one sees roots and trunks of trees, mostly those of Scotch fir, and almost invariably they bear the marks of fire. How these fires originated I am not certain; no doubt some were caused by drought and subsequent accidental firing; others were probably the result of clan feuds.

After passing this bleak stretch of moor and mountain one comes to a district singularly beautiful, even grand, and extremely interesting to the Nature-lover. The mountains around Loch Assynt, one of the most beautiful sheets of water in Britain, are very remarkable, and although none of them quite reach 3000 ft. in height, Suilven, Canisp, and Quinag amongst others, are three of quite the most isolated and picturesque heights we possess; the view especially of Suilven from the neighbourhood of Altnacealgah on the way to Assynt being very remarkable, the mountain standing up above its surroundings like a huge tooth, and from this point appearing to be quite inaccessible.

The whole district is studded with hundreds of small lochs, and in the hollows and on the sheltered sides of the mountains there is a fairly luxuriant growth of trees.

Assynt is unfortunately not a cheap district to visit at the present time; the cost of a first-class ticket comes to rather more than in 1912 I paid by the same class to travel beyond the North Cape in Arctic Norway! and even a third-class ticket costs a good round sum. The hotels, which are in most places the only possible places of accommodation, are the reverse of inexpensive; moreover, as they are usually full of fishermen, who are almost solely catered for, they are, perhaps, not in certain respects ideal places of sojourn for an entomologist.

In search of information as to where I should put up, I read in a local fauna book a statement that the north and eastern sides of Loch Assynt were of limestone formation and possessed a very beautiful flora, and as there was at the extreme north-eastern end of the loch, at a small hamlet named Inchnadamph, a famous fishing hotel, which had the reputation of being extremely

comfortable, I made arrangements to pass several of the weeks of 1920 there. I should mention that Inchnadamph was a place of sojourn of my predecessor, Mr. Hanbury.

Unfortunately the beautiful flora hardly materialised. It is true there were a few very local plants, including *Saxifraga azoides* and *Dryas octopetala*, which made a brave show, but the whole district was too bleak and destitute of wood and too wind-swept to harbour a numerous insect fauna, and although I did turn up a few interesting species, and passed a most pleasant time at the very comfortable hotel, the result of my visit, extending from June 20th to July 16th, was hardly satisfactory from the point of view of species or specimens procured. Fortunately, after my stay at Inchnadamph I spent a few days at the village of Lochinver, on the west coast, and what I saw there induced me to return this year. After securing apartments in a private house, and accompanied by my friend, the late Mr. F. G. Whittle, I reached Lochinver on June 18th last and stayed there until July 26th; Mr. Whittle remained until September 6th. The results of his observations during the period of my stay, also those which he made after my departure, and a list of the species of Tineina met with by him at Lochinver, are also included in this paper.

To reach Assynt one takes the train to Invershin in East Sutherland; from this station there are, daily, comfortable cars traversing the forty-five miles to Lochinver in about four hours, at a cost of sixteen shillings. The ride, perhaps unique in Britain for its wild, desolate grandeur, reaches its climax at the lower end of Loch Assynt. On the right of the road the precipitous cliffs of Quinag tower up, whilst the road runs along the shores of the beautiful lake on the left. At the head of the loch the shores are bleak and sterile, but gradually they begin to be clothed with fine old birch and rowan trees, and clumps of naturally planted Scotch fir. I do not know a more beautiful Scotch scene than the lower end of this charming lake.

The outgo of the loch is by the rapid and beautiful river Inver, some eight miles long, which empties into the head of a fjord or sea loch penetrating inside the general coast line about three miles. At the edge of this fjord the village of Lochinver is situated.

On the south side of the inlet stands what was formerly a seaside house of the Dukes of Sutherland, but is now known as the Culag Hotel, exceedingly comfortable and well appointed, but distinctly expensive.

Around this house the hillsides have been planted extensively with many kinds of trees, now of good size, and including larch, spruce, Scotch fir, ash, beech, birch and rowan. On the north side of the inlet there is a certain amount of natural wood, mostly birch, sallow and aspen, and a number of small flowery crofters' meadows.

The picturesque banks of the Inver, which are very precipitous and winding, are extremely sheltered from all winds, and as for the first two miles or so they have been planted with similar trees to those around the Culag Hotel, and in addition there is a fairly luxuriant natural growth of sallow, birch and sweet gale, they form a very suitable sugaring ground.

The whole district around Loch Inver is extremely rocky and irregular, with numerous small lochs in the hollows, and where there is shelter from the prevailing west winds there is a luxuriant growth of sallow of several species. *Myrica gale* abounds all over the district, as do the two common *Ericas* and *Calluna vulgaris*.

One of the drawbacks is that there is very little *vaccinium*, and what there is consists entirely of the most universally distributed species, *V. myrtillus*. The nearly allied *Arctostaphylos uva ursi* is locally a common plant.

Lochinver gets the full effect of the Gulf Stream, and for the latitude the climate is extremely mild; snow very seldom lies in winter, and the absence of severe frost is proved by the presence of the common tree fuchsia, which will stand all there is unprotected in the gardens. The rainfall in Assynt is very heavy. I gather that it almost always rains in the winter; certainly even this year there was rain more or less on the majority of the days during my stay, and I learned from Mr. Whittle that there was much more rain after my departure.

The mildness of the climate has produced its effect on the Lepidoptera; there is very little melanism, and in some instances the type occurring is distinctly southern. The most remarkable is unquestionably *Epinephile jurtina*, some of the specimens differing very little from those I have from the South of France, and from Spain—that is to say, they come very near to var. *hispulla*; Hüb.

We know that this form occurs in the Scilly Islands, but it will come as a surprise to lepidopterists to be told that it is also found in the North of Scotland. On the other hand the form of *Pieris napi* from the bleak and treeless Inchnadamph, fourteen miles inland, and amongst the mountains, if not actually the Alpine and Arctic form, var. *bryoniae*, Och., comes nearer to it than any British race I have seen.

One of the most abundant species to be found at Lochinver, and the principal reason of my second visit, was *Peronea hastiana*. On the afternoon of the day before I left Lochinver in 1920 I discovered that the sallows everywhere contained enormous numbers of the larvæ of this species, and the forms bred being so fine and variable I was very keen to get a further and larger supply of larvæ.

Just outside the coastline, blocking up the entrance to the fjord, and some three miles from its head, is the little island of Soyea, entirely treeless, and perhaps one thousand yards long

by five hundred yards wide. This island is uninhabited except for a few sheep and goats, and quantities of sea-fowl. I paid several visits and the results were most interesting. The island has, considering its size and situation, an extensive Lepidopterous fauna. The larvæ of *Peronea hastiana* swarmed, as on the mainland, and several species occurred which could not be found elsewhere, including *Anthrocera filipendulae*, *Sericoris cespitana* and *S. littoralis*. Perhaps the most remarkable colony on Soyea was one of *Abraxas grossulariata*, which was rare on the mainland but swarmed on the island. The usual food-plants did not exist, and the only plants in its haunt, except a very limited amount of grass, were bracken and *Calluna vulgaris*; I have not any doubt but that the larvæ fed upon the latter, which, according to Mr. South in 'British Moths,' is the food-plant in the Hebrides.

I cannot say that Lepidoptera were met with at Lochinver in great abundance, except in the case of a very few species; in fact the great bulk of them were distinctly rare. Nor can I say that any great rarities were found; one could hardly expect these in such a remote corner of the British Isles. Still, a large number of species occurred, some interesting ones amongst them, and the forms in many cases were distinctly interesting. The number of species observed in Assynt in 1920 and 1921 was 232, as follows:

Those species marked with an asterisk occurred at both localities. It should be noted that sugar was only tried at Lochinver.

Pieris brassicæ.*—Common at Lochinver, one or two specimens in the hotel garden at Inchnadamph; large, with the black markings well developed.

P. rapæ.—Lochinver.

P. napi.*—Towards the end of June, 1920, I observed several whites flying in a swamp near the head of Loch Assynt; these were found to be worn examples of this species very strongly marked, and with a good deal of dusky clouding on the bases of the superiors, thus showing some approach to the boreal and alpine form ab. *bryoniae*, Och. A search of the sides of a ditch draining the swamp resulted in my finding a number of ova and larvæ feeding upon *Cardamine pratensis*, the only wild crucifer I saw in the district. The resultant imagines, 24 in number, emerged in May last, and are very interesting. Although not identical with ab. *bryoniae*, they present a very distinct approach to that form, and several of the females are very near examples I obtained at Semmering in Styria at a height of about 4000 ft. in 1910. The bases of the superiors are dusky, and the veins are very strongly developed owing to their being thickly shaded with dusky scales; the undersides are very strongly veined, the ground-colour of the inferiors

being greenish-yellow with very strongly-developed fuscous shadings on the veins. The females on the upperside strongly resemble the example figured in Barrett, plate iii, fig. 1c. Two of them have an ochreous ground-colour, in this respect also resembling ab. *bryoniae*. There is no doubt but that at Inchnadamph the species is single-brooded. At Lochinver on July 17th last I netted a single very fresh example, the only one noticed, a female. This specimen resembles very closely the second-brood south of England form; it has only slightly dusky shaded bases to the superiors, the usual dark markings are well developed and bright, and the veins on the underside are similar to the southern summer form. There is not any doubt in my mind but that this is an example of a second brood; it closely resembles Barrett's figure on plate iii, fig. 1a.

(To be continued.)

NOTES AND OBSERVATIONS.

COLIAS EDUSA MIGRATION IN CANNES DISTRICT.—We have had a remarkable visitation of *C. edusa* to the waste just around our villa, and in to the town (Le Cannet). Almost wherever *Inula* and calamint were blooming it swarmed, and passed downwards towards the coast from September 10th to October 20th, when with the cessation of the flowering of *Inula viscosa* they ceased too, having, I feel certain, re-migrated to Algiers or Egypt *via* Corsica (?). At any rate I am sure they re-migrated, their destination being, of course, a hazard. That these insects had migrated in the first place to Le Cannet I insist upon from the following facts. Firstly, they had all undoubtedly travelled, and showed signs of wear. Secondly, the insects themselves were larger than the normal local late summer brood (? first autumnal), and appeared to agree with the large form described as being found in Sicily (*cp.* Dr. Verity's remarks, 'Entom.,' vol. liv, p. 187). Thirdly, they were almost all females, or at least 80 per cent.—abs. *helice* and *pallida* about 30 to 40 per cent., *Helicina*, a few, a beautiful bright (fore wings) cadmium female, with green-yellow hind wings being to me a new form, border as in ab. *adoratrix*, Stauder; others of varying depths. One *pallida* with damaged right fore wing is the largest *edusa* I have ever seen. I took about 80 *helice*, *helicina*, *pallida*, and about 60 other orange forms, typical, etc. This series convinces me that it is impossible to say where one form leaves off and another begins; that is to say, all the aberrations and varieties merge one into the other in the case of *helice*, *helicina* and *pallida*, for they show all shades. During the latter part of the passing, for such it was, as the whole ground was worked every day by Mr. Tucker and me, and a new batch identified and picked out which, for the greater part, were not there the previous day, and together with the fact that as we worked inland they became scarcer, although the plant did not, seems to indicate that they worked down to the coast, and, as I think, crossed the sea. The almost entire disappearance with the passing of the flower was also most striking, although at the time of

writing (November 13th) there are still stragglers. Both type and *helice* visited the Zinnias in the gardens until the welcome break in the unprecedented drought a few days ago. Males became more plentiful the last fifteen days of the flight, and some of these, as well as females, were smaller and of the pale-yellow costa type known as *chrysothemeformis*, Verity, transitional to *gen. vern.* By the way, it is curious that Dr. Verity has given this name, for although I knew nothing of the name having been accepted I had noticed this resemblance, and have the name in my correspondence with Mr. Rowland-Brown, which only goes to show how striking is the resemblance to *C. chrysotheme*. The late autumnal partial reversion to spring forms occurs here in many Pieridæ, *P. rapæ* and *P. manni* especially, *P. brassicæ* and *Pontia daphidice*; all these often show this peculiarity.—C. E. MORRIS; Le Cannet, Alpes-Maritimes, November 13th, 1921.

[A century ago Stephens figured *C. chrysotheme* as a British species with rather vague indications of origin (Stephens, 'Haust.,' i, fol. 2). Feeling some doubt on the subject, and that Stephens might have figured *C. edusa*, *gen. vern.*, in error, I asked my friend Mr. Sheldon to examine the record for me, being confined to the house, and not possessing Stephens' work. He agrees that the insects, ♂ and ♀, figured are *chrysotheme*, but, as I myself, is convinced that the models were of foreign origin. I may add that collectors in France again and again have announced the capture of *chrysotheme*, though none of the great cabinets contain an authentic example. Those announced have usually turned out to be the very *chrysothemeformis* of Mr. Morris's note.—H. R.-B.]

BLUE SPOTS IN *CHRYSOPHANUS PHLÆAS*.—With regard to the discussion as to damp places and climates, causing or affecting the blue spots in *C. phlæas*, I may add that we have had a drought unprecedented in memory here, and the hottest of autumns, and the blue spots are larger and bluer than I have ever seen them. But I think damp was found to have nothing to do with it, and you had "indigenous" evidence that the spots were developed just as finely in dry places as upon marshes.—C. E. MORRIS; Le Cannet, Alpes-Maritimes, November 13th, 1921.

COLIAS ELECTRA AND *C. LESBIA* (?): PREPONDERANCE OF PALE FORM.—I have read with interest Mr. Rowland-Brown's article on the variation of *Colias edusa* ('Entom.,' vol. liv). I thought that perhaps it might be useful to state that when I was in Natal in 1897-8 I took *C. electra* there commonly, but that the proportion of females of the pale form greatly outnumbered the ordinary yellow females. Trimen, in his work on South African butterflies, announces the pale female form of *electra* scarcer than the yellow form. Among those of *electra* I took, I find that the proportion of the pale females was about 3 to 1 of the yellow form. My specimens were all taken in the Ladysmith district. My wife collected any butterflies she could for me in Uruguay, and among the things she brought back were several, I think, of *C. lesbia*. They consisted of about 6 males, two dark, and 10 pale females. They were all taken casually, so it seems to indicate that the pale form predominated. Perhaps in the warmer climates the pale females outnumber the yellow form,

and as the genus approaches colder regions the reverse takes place.—DUDLEY WESTROPP; National Museum, Kildare Street, Dublin.

COLIAS EDUSA IN SOUTH DEVON.—Further to the Rev. J. E. Tarbat's record of the appearance of *C. edusa* at Budleigh Salterton in August last ('Entom.', vol. liv, p. 242), the insect seems to have been fairly common along the coast, as I saw it in some numbers in September. My son noticed the first, apparently a female, flying over the shingle at the base of the cliffs on September 15th just below Salcombe Regis. On going up the valley to a flowery meadow we saw several others and captured two, one of which was a female. One or two rough days followed, but on visiting the same ground quite a number were seen, a good many of which were flying over a field of marigolds apparently seeking places of rest for the night. One or two more were taken but they were somewhat worn and were released. In the course of a week the brood dispersed, and odd ones were noted a few miles inland and on the coast near Ladrum Bay. The female taken on the 15th was put in an ordinary glass jam-jar with some red clover and covered with net, which was placed in a sunny window with partial shade. She laid about one dozen eggs on each of the first three days, and on the fourth, which was exceedingly hot, nearly 100, but a good number of the latter proved unfertile. The obliging female then died. The eggs began to hatch on September 27th and continued to do so irregularly for about three weeks. On reaching home in October the larvæ were placed on potted-up plants of *Trifolium repens*, upon which they seemed to do well. Red trifolium they refused when white was available. As there was a small patch of lucerne within fifty yards of the house, a crop which I have never seen grown in this neighbourhood before, a number were given this food as a change of diet and commenced feeding upon it at once. Being so late in the season and as I have no glass the cages were placed in a warm bathroom at night and later inside a heated linen cupboard. The temperature of the cupboard went up to a great height occasionally, especially once when the door was inadvertently shut, but the larvæ seemed to get active with both heat and sunshine and generally began to feed. The young larvæ ate their own eggshells, and at each instar devoured every fragment of the old skin, beginning with the head. Not a single old head or skin was found in the cages during the larval stage. The first pupated on October 20th. The linen cupboard was still requisitioned, and the first imago appeared on November 3rd and the last on November 22nd. In all 56 were bred, 31 males and 25 females, of which 10 were var. *helice*. Out of this total there were five cripples. Most of the specimens are of good size, some being larger than those taken at Sidmouth. The female from which the eggs were obtained was normal in coloration with the light spots on the margin of the fore wing well marked. The majority of the females reared and especially the *helice* are remarkable for the absence of the marginal spots, many of them being very dark and the black bands quite deep. I am told that for 40 per cent. of the females to be *helice* is unusual. Can this be accounted for by the absence of sunshine or the heat of the linen cupboard? The males are typical.—G. HANSON SALE; Coxbench, Derby.

FOOD-PLANTS OF *CALLOPHRYS AVIS*, AND *CELASTRINA ARGIOLOUS*.—Any doubt as to *Arbutus* (*unedo*?) being a food-plant of *C. avis* is set at rest in the first part of fasc. xix, 'Études de Lépidoptérologie Comparée' (January, 1922) which has just reached me from Rennes. This volume is devoted wholly to the Lepidoptera of Morocco, and in the note on *C. avis*, Chpmn., it is stated that Mr. Harold Powell found it rather common in the Zehroun district of the Lower Atlas in March and April last year. The larva feeds there on *Arbutus*, on which shrub a female was observed laying her eggs. In November, 1920, Mr. Harold Powell discovered larvæ of *Celastrina argiolus* also feeding inside the flowers of the *Arbutus*, and observed a female ovipositing on the young shoots of hawthorn in February, 1921, at Mrassine. I mention this because neither *Arbutus* nor hawthorn is included in Tutt's exhaustive list of food-plants for *Argiolus* ('Brit. Butterflies,' vol. ii, pp. 410 and 447-448). In a shrubbery in my garden, *Ilex* (*loc. cit.*), holly and *Arbutus* grow side by side, and ivy is not far off, but I never saw the females egg-laying on *Ilex*, or *Arbutus* which flowers here in October and is a great attraction to *P. atalanta*, though I did once detect a female laying on *Berberis* (Gallipoli, *loc. cit.*). I regret to add, however, that *argiolus*, which had been fairly abundant here for many years, disappeared entirely in 1920. Whether *Arbutus* is the food-plant of *C. avis* on the French Riviera in those localities where *Coriaria myrtifolia* is absent remains still, I believe, to be proved by experience. (Cp. Dr. Chapman's, and my own notes on the subject, 'Entomologist,' vol. xlix (1916), pp. 187-188.)—H. ROWLAND-BROWN; Harrow Weald, January 18th, 1922.

EROMENE OCELLA, ETC., IN LANCASHIRE.—On October 5th, at 11.45 p.m., I observed two moths at the window of my room. On examining same I find one is *Eromene ocella* and the other *Achraea grisella*. I have been successful during past season in taking a nice series of the new British species, *Blastobasis lignea* and var. *adustella*, along with intermediate forms. I have taken a few each year since 1918, but it was only identified last winter by Mr. Durrant.—ALBERT E. WRIGHT; "Brunleigh," Kents Bank Road, Grange-over-Sands.

PYRAMEIS ATALANTA IN DECEMBER.—Perhaps it might be of interest to record that I saw a specimen of *Pyrameis atalanta* on December 11th, 1921. This seems rather late in the season for the species.—J. M. JAKES; The Red House, Banstead, Surrey.

THE PUPAL HABIT OF *TELEA POLYPHEMUS*.—My late friend and correspondent, Mr. E. N. Collins, who resided for several years in Canada, removed about 1886 to the neighbourhood of Jacksonville, Florida, and very soon after wrote me as follows: "Can you give me any idea why *polyphemus* here fastens its cocoon to the branch of the tree instead of rolling it up in the leaf and letting it fall to the ground, as it always does in the Northern States?" With the inquiry he enclosed a small cocoon, showing the invariable attachment to a twig of Florida cocoons, which is a strong silken pedicel about 5 in. in length. I replied suggesting that in the Northern States the cocoons would lie warmer on the ground amongst dead leaves during

the severe winters, whilst field-mice and other possible enemies would be hibernating, but that in the usually mild winters of Florida they would be far safer if hanging upon the trees, as the mice might not be dormant. I have searched in vain amongst American entomological literature for any reference to this habit of southern pupæ of *polyphemus*, but have recently accidentally found a paper in the 'Canadian Entomologist,' vol. xxvii, September, 1895, by the late A. R. Grote, entitled, "Notes on the North American *Saturnia*." After giving particulars as to the larvæ, Grote continues: "There remains for me to point out some facts with regard to the formation of the cocoon in our American genera which induces my arrangement of the family. In *Attacus*, *Philosamia* and *Callosamia* the larva attaches the deciduous leaf, which forms the basis and natural attachment for its web, firmly to the branchlet by a pedicel of silk. Evidently this is an acquired habit. It has been found more useful to the species that the cocoon be prevented from falling to the ground with the fall of the leaf. *Telea* and *Actias* have not this habit. The cocoon falls in the autumn with the leaf which was used in the spinning. . . . I therefore place the genera with the pedicel habit at the commencement of the family, *Saturnia* and *Samia* following, and closing with *Actias* and *Telea*, in which the thinner cocoon falls with the leaf to the ground." It is evident from the above that the departure of the southern cocoons of *polyphemus* from the habit of the northern examples was quite unknown to Grote, or it would have materially affected his classification of the group. If, as I imagine, this point is still very little known, it seems advisable to place it on record; it certainly is a very remarkable adaptation of a species to the varied circumstances of its environment.—GEO. C. GRIFFITHS, F.E.S.; 3, Leigh Road, Clifton.

VITALITY OF *BRENTHIS EUPHROSINE*.—In June, 1919, I went with Mr. A. Simmons to Lincolnshire for a few days' collecting. On the last morning five *B. euphrosyne* were captured and boxed. On reaching our rooms they were put in a killing bottle. Lunch was hurried as we had to catch a train. A question arose as to whether they were dead. We decided that they must be, as a sufficient time had elapsed. They were accordingly taken out of the killing bottle and put in a Newman's relaxing tin. It was ten days later before time was found for setting, but when the tin was opened and the cotton-wool lifted, all five of the *Euphrosyne* crawled out and at once began to fan in the lamp-light. They had been tightly pressed between the wool and were quite uninjured. They are now in the cabinet. The tin was rather an old one.—G. HANSON SALE; Coxbench, Derby.

SYMPETRUM SCOTICUM, DON., IN DORSET.—Mr. Lucas says, in his "Notes on British Odonata in 1920," that Mr. Stowell's record of *Sympetrum scoticum*, Don., on Parley Heath "seems to be almost or quite the only record of its occurrence in Dorset." The species is abundant in all suitable localities, in late summer and autumn, throughout the county. It has been recorded by C. W. Dale in the appendix to his 'Lepidoptera of Dorset' (first edition, 1886) as "generally distributed." I alluded to it as "abundant as usual" in

my notes on "Dorset Odonata in 1911" in the 'Entomologist' of July, 1912. It is also called "abundant" in the 'Proceedings of the Dorset Field Club,' 1917, p. 226.—F. H. HAINES; Brookside, Winfrith, Dorset, January 1st, 1922.

SOME NOTES ON THE HABITS OF ♂ TABANIDÆ.—The following observations were made in the New Forest—an especially favourable habitat, as most visitors there will admit from painful experience, for the blood-sucking "horse flies"—but the majority of the species enumerated occur commonly elsewhere in the south, so that it is not thought necessary to "localise" the subject of this article. The scarcity of the harmless ♂ Tabanid compared with the abundance of the ♀, with its apparently insatiable thirst for fresh blood, seems to have puzzled our too few Dipterists, and one seeks in vain through the text-books* for some satisfactory explanation of the cause. Most authorities, however, seem agreed, and with reason, on one point—*i. e.* the liking of the males for heights. Whether hovering "over mountain tops" (*sic*) or merely sunning themselves on the leaves of the highest oaks, it is difficult to tell, but undoubtedly they spend the most of their time in the higher air, whence, it seems reasonable to suppose, the female joins them after sanguinary work below. [At least such seems to be the case with the bigger species (*Tabanus*), but the smaller (*Chrysops*) prove a partial exception; the males of this family, although adapted, as their wings and build indicate, for rapid flight, show a fondness for flowers, and follow their respective females in possessing a much more sluggish habit than their larger brethren.] Previous to the past tropical summer (1921), the capture of a ♂ *Tabanid* was considered by me quite *the* catch of a day's hunting, but the exceptional conditions produced by prolonged drought somewhat altered this opinion, and besides resulting in the capture of a large number of specimens, gained me a useful insight as to the habits of these remarkable creatures. Towards the middle of July most of the Forest streams were reduced—in the expressive phrase of an entomological friend—to a chain of puddles, and it was whilst prowling round a "muddy" link of the erstwhile clear and trickling "water (?)" that a growing suspicion that many of the thirsty forms of insect life continually "dipping" into the pool would prove to be ♂ *Tabanidæ* at last became a certainty by the capture of a number of *T. bromius*. The catching was a matter of some difficulty, the flies coming down with almost the swiftness of a falling stone, just "sipping" the water and then flying straight up again, the art being to net them on the uptake without collecting more of the pool in the bag of the net than could reasonably be helped. By perseverance, however, and the use of a spare "kite" net—the usual small implement used by Dipterists here being useless—I managed to obtain the following species of ♂ *Tabanidæ* by the end of the day (identification, of course, is difficult, but no doubtful specimens are included): *Hæmatopota pluvialis*, Linn.; *Theriopectes solstitialis*, Meig.; *Th. tropicus*, Harr.; *Tabanus bovinus*, Linn.; *T. bromius*, Linn.; *T. maculicornis*, Meig.; *Chrysops cæcutiens*, Linn.; *C. relicta*, Meig., and *C. quadrata*, Meig. The capture of three

* I must confess to almost complete ignorance of Continental works on Diptera.

species of *Chrysops* from the same pool was rather extraordinary, as up to then I had not found even ♀ ♀ of *relicta* in the Forest at all. For the sake of my determination I was greatly relieved to take several females later from the same locality (Rhinefield). The *Tabanus bovinus* males taken numbered six, and were the first I had captured of the sex. The flight is extremely swift and difficult to follow, but they seemed to come down from a great height, give one "dip" or a series of "dips"—in which latter case invariably in a rapid circle—and then instantly fly up again out of sight. The smaller species of *Tabanus* behaved in much the same manner, allowing for their size and weaker flight, but *Therioplectes solstitialis* (next to *T. bromius* the commonest present) was much more casual in its mode of flight, and not infrequently "rested" for a short space on some convenient leaf overhanging the stream. The "rest" was presumably for the purpose of imbibing the water collected on the forelegs during the "dip" above mentioned, for, so far as I could make out from my necessarily brief observations, this was the method used for drinking, although possibly a certain amount of moisture is gathered in the beak-like proboscis as well.* Moreover, in support of the above theory, the rest was never a preliminary to a dip, although I have found the same species (♂) sitting on leaves of bushes† in the drives of enclosures miles from any surface water, in which case the insect was probably merely carrying out a habit common to all Diptera—i. e. a love of basking motionless in the sun. On several occasions in the spring I found *Therioplectes tropicus* ♂ ♂ sitting on damp mud by the margins of partially dried-up puddles, but most specimens of *Tabanus* upon being captured in this position have simply proved to be females. *Chrysops* and *Hæmatopota* males, however, are great "mud-sitters," and the former have also a liking for flowers (especially *Senecio* and *Mentha arvensis*), which causes them to be much more commonly taken than the larger members of the group. *Atylotus fulvus*, Meig., was one of the species that failed to turn up at my observation pool, preferring more open, heathy woods, or those adjoining heaths, but I managed to secure a male last year (1920) on Setley Plain, near Lymington. In this case the creature must have been flying just over my head at the time, for upon hearing a distant "buzzing" I whirled my net rapidly, and so luckily caught undoubtedly the most handsome of all our ♂ *Tabanidæ*. With a remembrance of the above capture I tried the same locality in 1921, but this time without result. The formerly heathy and boggy ground was dried brown and cracked by the sun, and even the females were at a premium. Another absentee was *Tabanus autumnalis*, Linn., a fine large species which is none too common in the Forest—I write from the Dipterist's point of view!—but I could have taken the males of several common species (notably *T. bromius*) in scores had I desired, to say nothing of hundreds of females, and yet not once did I witness a pairing. Judging from the habits of both the ♂ and ♀ *bovinus*, this all-important function must either take place in the air, or, as the only

* Such as when a "series of dips" is given. See *bovinus*.

† Generally in the early morning. In normal seasons the dew on the leaves may provide them with sufficient moisture, as one seldom sees the males at water, or mud, except in very hot and dry weather.

alternative, high up on some sunny tree-top. Certainly it is the habit of the ♀ to fly high, as one seldom hears the extraordinary deep and characteristic hum until the insect is actually circling round one—a good enough indication that the creature first views its victim from a considerable height. Again, the only ♂ *A. fulvus* taken was undoubtedly hovering over my head at the time, and may have been making a final unsuccessful bid for some elusive “she” just alighted on my coat from on high. “From on high,” however, may be a mistaken term in the case of the heath-haunting *fulvus*. The wood-frequenting species, with their intolerance of deep shade, would naturally keep above the tree-tops, except when a forest clearing, such as afforded by the comparatively modern “drive,” allows the females to descend on some passing prey; but the *Tabanid* of the open heath is under no such restriction. He may fly where he likes, and for all we know may take his partner for life on some neighbouring gorse bush. If so, there some day I shall find him!—HUGH JONES; 7, Gosport Street, Lympington, Hants.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, October 17th, 1921, Mr. R. Tait, President, in the Chair.—Exhibitions were numerous and varied as is usual at the opening meeting of the session.—The Hon. Sec. exhibited on behalf of Mr. O. J. Wilkinson photographs of (a) *P. cardui* pupating, (b) larva of *Hadena pisi*, (c) an unusual variety of *P. phlœas* taken at Delamere having the right side var. *schmidtii* and the left side typical.—Mr. W. Mansbridge showed Lepidoptera from North Lancashire, *Vanessa io* with nearly blind eye-spots on hind wings from Cark; *Lycæna ægon*, var. *masseyi*, from Witherslack, and a short series from Delamere for comparison. From Arnside, Westmorland, *Argynnis euphrosyne* with pale ground-colour, *Thecla betulæ*, *Nisoniades tages*, *Asphalia diluta*, *Phytometra viridaria* and *Ennychia octomaculalis*; from Formby, near Liverpool, a series of *Ebulea crocealis*, and from Cark a short series of *Gnophos obscuraria* of a dark grey colour.—The Rev. F. M. B. Carr showed a long series of *Epunda lutulenta* from his garden at Alvanley, and said it had been abundant there in the autumn; also two fine varieties of *Asphalia flavicornis* and several *P. cardui* from Delamere.—Mr. S. P. Doudney northern insects as follows; *Lycæna minima*, *Hyria muricata* and *Strenia clathrata* from Witherslack; *Erebia epiphron*, *Coremia munitata*, *Larentia cæsiata* and *Venusia cambricaria* from Cumberland. In the same exhibit was a fine under-side aberration of *Lycæna ægon* with elongated spots captured at Delamere.—Mr. S. Gordon Smith was unable to be present, but sent a fine drawer of *Smerinthus tiliæ* and a large number of varieties of other species captured or bred this season in various localities; prominent among the latter was a specimen of *Triphæna pronuba* with hind wings

nearly white, bred from a wild pupa dug at Tarvin near Chester; an ab. of *Vanessa urticae* with nearly black hind wings captured at Parc Llwydiarth, North Wales; *Triphæna fimbria* with crescent mark on hind wings, bred from Delamere, two vars. of *Nemeophila russula* also with hind wings black nearly all over taken in the New Forest, confluent forms of *Zygæna trifolii*, *Boarmia roboraria*, *Phorodesma pustulata*, *Pterostoma palpina* and *Leucania turca* from the New Forest. A fine series of *Cidaria truncata* from various localities, comprising vars. *centumnotata*, *commanotata*, *perfuscata*, etc., was much admired, and a long series of *Boarmia repandata* which contained several examples of the Penmaenmawr melanic form characterised by whitish submarginal blotches on the black ground.—Mr. Chas. P. Rimmer had a box of Micro-lepidoptera taken this year chiefly round Liverpool, also his fine series of *Hibernia defoliaria* from Delamere.—Mr. A. W. Hughes exhibited from Witherslack a long series of *Carsia paludata*, *Lycæna ægon* and *Cænonympha typhon* and *Argynnis euphrosyne*, the last being from Cartmel.—Mr. R. Tait brought Wicken insects as follows: *Catocala nupta*, *Apamea leucostigma* and var. *fibrosa*, *Calamia phragmitidis*, *Noctua umbrosa*, *Hadena trifolii* and *Phibalapteryx vittata*, and a few *Papilio machaon* bred from ova found in 1920. *Plusia moneta* is now well established in Cheshire, as shown by a long series from Carrington included in this exhibit. The New Forest was represented by *Macroglossa fuciformis* and *Nemeobius lucina*, and North Wales by a nice series of *Agrotis ashworthii*.—Mr. J. B. Garner-Richards, Mr. J. W. Griffin and Mr. H. B. Prince also made interesting exhibits.—WM. MANSBRIDGE, *Hon. Sec.*

RECENT LITERATURE.

Insect Transformation. By G. H. CARPENTER, D.Sc. 8vo. Pp. x + 282, 4 Plates and 124 Text-figures. London: Methuen & Co., Ltd., 1921. Price 12s. 6d. net.

A carefully prepared volume and well worth the money, which unfortunately cannot be said of all the recent attempts of writers of this style of entomological publication.

The author takes as his first example a grasshopper, which is dealt with very fully as to morphology and development, and follows this up with similar but briefer studies of a dragonfly and of a moth. This is succeeded by chapters on development in the Exopterygota, the Endopterygota and some Apterygota, in which a very large range of types is surveyed and the salient features of their transformations emphasised. There follows a short chapter on classification, and then the most important question of the influence of environment on all stages of insect life is dealt with ably and at considerable length. To many readers the last chapter, on the phylogenetic interpretation of the known facts of development in the order, will probably prove the most interesting.

The Lancashire and Cheshire Naturalist, vol. xiv, No. 1, 1921.

The above part of this well-known journal contains a short but interesting article by J. C. Melvill on the Sidebotham Collection of British Lepidoptera recently presented to the Manchester Museum. The collection is a valuable one, being chiefly remarkable for the number of rarities it contains, such as, to mention only two species, a very fine series of *Heodes dispar* and a genuine British specimen of *Bryophila algæ*.

OBITUARY.

DR. T. A. CHAPMAN.

THE angel of death has taken a heavy toll from the ranks of British Entomologists during the past year, but the beating of his wings has not been heard so loudly as when it heralded the departure from amongst us of Thomas Algernon Chapman; for in him Entomology has lost one of its foremost figures, one who was respected and admired by all who knew him.

"The Doctor," to give him the name by which he was universally known by his very numerous friends, was born at Glasgow on June 2nd, 1842, and he would thus be in his eightieth year at the time of his death, which occurred at his residence at Reigate on December 17th last. He was the son of Thomas Chapman, himself a well-known entomologist, from whom no doubt he inherited his tastes for the insect world. Although born at Glasgow, Dr. Chapman was English on both his father's and mother's side.

According to the 'Times' he "qualified as L.R.C.S. Edin. and M.D. Glasg. (Honours). He became Resident Physician and Surgeon of the Glasgow Royal Infirmary, and afterwards joined the Staff of the Abergavenny Asylum; later he obtained the appointment of Medical Superintendent of the County and City Asylum at Hereford," an appointment he relinquished about the year 1896. Shortly after this date he came to reside at Reigate; he was never married.

Without doubt the late Dr. Chapman was one of the greatest and most scientific entomologists we have ever produced, and one who in certain departments must be regarded as the greatest exponent Britain has given the science. Some of his characteristics can perhaps be best conveyed by quoting the following description written of him by his great friend and co-worker the late J. W. Tutt some twenty years ago: "An unlimited capacity for hard work, a scientific training that can only be attained by entomologists who follow medicine as a profession, an omnivorous reader, a logical reasoner, and a profound thinker, these are amongst the factors that have united in placing him in the very front ranks of the entomologists of his time." Foremost amongst his remarkable powers was his acuteness of observation; little facts that others would not have noticed were seized upon, their significance realised, and important deductions made therefrom. His clear logical mind and soundness

of judgment were of the greatest importance, and usually led him straight to the desired goal.

It was the writer's good fortune to spend a few weeks at Hyères during one of "The Doctor's" visits to that resort; and he vividly recollects the walks and talks we had, and his wonderful powers of observation. Nothing seemed to escape his notice, and upon everything discussed or seen he had thought deeply. First a busy stream of ants we passed on the path attracted his attention; then it would be the burrow of a trap-door spider in a sandy bank; the cryptic attitude of a mantis; or some striking peculiarity in the structure of a flower: about all of these and others he would point something of absorbing interest; to him all Nature was an open book. I remember wondering if even Darwin could have been more interesting and instructive!

Although primarily a lepidopterist, with which order the great bulk of his work was associated, the other orders received at different times a great deal of attention, and on each occasion in which he became interested in a problem affecting them some important and interesting scientific discovery was bound to take place. On one occasion when I called upon him he was deeply interested in the life-cycle of the common earwig, and on the next, the method of oviposition of certain species of the *Tenthredinæ* was being studied, and something previously unknown was pointed out. On my last visit he was most anxious I should ascertain the meaning of a remarkable pupal structure of a Pyralid moth he had detected, and had not time to work out.

Had circumstances led him in the same path as Fabre, he would have been to British Entomology what that fascinating personality was to that of France, but his work would have been far more correct than some at any rate of that of the brilliant Frenchman.

His entomological work was carried out in a thorough manner, and every detail carefully studied and worked out by his acute and logical mind; it was always illustrated profusely with explanatory plates, many of them exquisitely drawn and coloured, and costing large sums of money. His assistance to the Entomological Society by the gift of the beautiful plates by which his papers in the publications were accompanied is attested by a glance through the list of benefactions. Whenever money was required for any purpose in connection with the science he loved so well, an intimation to him was always sure to meet with a generous response.

Although he collected a great many specimens of the Lepidoptera a collection in the ordinary sense of the word was never made; his specimens were used for scientific purposes only, and the choicest of them were cut up remorselessly if science demanded it. They were equally at the service of his friends if required for a scientific object.

It was in connection with his association with the late J. W. Tutt that a vast amount of his entomological work was done. The association of the two was greatly to the advantage of the younger man, for "The Doctor" in his work, as in everything else, was absolutely unselfish; his sole anxiety in dealing with a scientific problem was that it should be solved: it did not signify to him one iota whether he or someone else solved it, provided it *was* solved. Consequently a great deal of the work that appears in Tutt's books his co-worker

was solely responsible for. In justice to Tutt it should be stated that wherever possible he acknowledged the value to him of the work of his friend, of whom he was an enthusiastic admirer. Obviously, however, there was a great deal that was not and could not be acknowledged.

After Tutt's death Dr. Chapman wrote of the association as follows: "Entomology, therefore, owes to Tutt not only Tutt's own work, but also that of his collaborators, which would otherwise not have been done. As one of these I have sometimes felt a grievance that I elaborated material for Tutt when I would have preferred to work on lines of my own selection." His scientific work as an entomologist—and all of his work was scientific—is, in addition to that included in Tutt's books, scattered through the publications of the Entomological and Zoological Societies and the various entomological magazines, to most of which he was a prolific contributor. It is far too voluminous to be mentioned here, except in the case of a few of his more important subjects.

Some of the most valuable and interesting work he ever undertook was the elucidation of the earlier stages of certain species of the *Lycaenidae*, including his share in working out the life-history of our own *Lycaena arion*. Most remarkable and characteristic of him was the sagacity with which he discovered that the mysterious winter food of the larva was the larvæ of its ant hosts themselves! It will be remembered he detected this by subjecting to microscopic analysis the contents of the intestinal canal of the only larva obtained by making a journey to Cornwall! Remarkable, too, was the discovery in the south of France of a butterfly new to science and named by him *Callophrys avis*, very similar to *C. rubi*, but abundantly distinct from it.

Dr. Chapman was one of the earliest lepidopterists to appreciate the value of the genitalia in determining nearly allied species and much of his most valuable work is in connection with this subject. Amongst other results obtained by this means was the discovery, or rather re-discovery after the original discovery had long been discredited and forgotten, of a *Lycaenid* butterfly, superficially very near to *Polyommatus icarus*, but which was shown by its genitalia to be much nearer to *Agriades escheri*—a species it is superficially quite unlike. This re-discovery was *Agriades thersites*, Cantener. By the aid of the genitalia he detected the distinctness of *Everes alcetas* from *E. argiades*, with which it had previously been included. He also separated *Erebia palarica* from *E. stygne*, and proved that what had hitherto been denominated *Plebeius argus* (*ægon*) consisted of several species.

His researches into the earlier stages of the *Lycaenidae* included the discovery of the larvæ of the following species: *Polyommatus eros*, *Agriades escheri*, *A. thersites*, *Lattiorina orbitulus*, *L. pyrenaica*, *Albulina pheretes*, *Lycaenaalcon* and *L. euphemus*. His work on these, most carefully and minutely described and magnificently illustrated, is to be found in the 'Transactions of the Entomological Society.' His achievements in this group alone, if it had included everything he ever did, would have satisfied most men, and would have stamped him as an eminent lepidopterist.

One of the tasks most useful to the student of British Lepidoptera he undertook was the examination of the genitalia of that difficult group the *Scoparidae*. This is to be found in the 'Transactions of the Entomological Society' for 1911, pp. 501-518 and plates xxxv-xliv. The examination did not disclose any new species, but it cleared up several doubtful points, and established as good species some that had hitherto been considered doubtful. A most important paper is entitled "A Revision of the Genus *Erebia*, Based upon the Examination of the Male Appendages" it is to be found in the 'Transactions of the Entomological Society' for 1898, pp. 209-239 and plates v-xvi. It was written in connection with an equally important paper on the genus entitled "A Revision" by Mr. H. J. Elwes, which precedes it. One of his principal earlier papers is the first article published in the first volume of his friend Tutt's magazine, the 'Entomologist's Record,' "The Genus *Acronycta* and its Allies," dealing with all the species in that very composite group, and splitting them up into several new genera. The details are worked out in his usual thorough style, and all the stages are exhaustively treated.

Dr. Chapman was a supporter of the law of priority in nomenclature in the most pronounced sense of the word. He held that a name once given must stand unaltered, no matter if it was ungrammatical, or even misspelt. He would argue, if you once permit alterations there is no tribunal with authority to bid you where to stop. The present writer is of opinion that his views were entirely justified.

He was one of the strongest exponents of the doctrine that we cannot satisfactorily classify species by one character alone, no matter whether it is by the ova, larva or pupa stage, or by structure and markings of the imago, but that we must take everything into consideration. There does not seem to be any reason to doubt but that this view will ultimately prevail.

Dr. Chapman made many expeditions, in search principally of Lepidoptera, to various parts of Europe; prominent amongst these were several journeys to Spain, in which he was accompanied by his friend Mr. G. C. Champion. These expeditions were designedly directed to unworked districts and resulted in several important entomological discoveries; the records he has given of them are amongst the most fascinating of their kind that have ever been written.

He possessed one of the finest and most complete entomological libraries owned by any private individual in this country, practically everything that has been written upon the Palearctic Lepidoptera being included in it.

"The Doctor" was a very regular attendant at the meetings of the various scientific societies of which he was a member, took much interest in their proceedings, and usually contributed something of weight on the subjects discussed. He was Vice-President of the Entomological Society on half a dozen occasions, and often served on the Council. For some unknown reason, although repeatedly invited, and even pressed, he declined the Presidentship, which had been held by Alfred Russel Wallace, H. W. Bates, Lord Avebury, Lord Walsingham, H. T. Stainton, and most of the great British

entomologists who have lived during the past three-quarters of a century, and to which his friend Tutt was elected, though he did not live to occupy the Chair.

He was a Fellow of the Zoological Society, but the greatest honour came in the year 1918, when one of the few Fellowships of the Royal Society that have come the way of entomologists of recent years was conferred upon him.

In his youth he was noted for his great activity and staying power; a walk of forty miles or so was frequently undertaken and enjoyed, and the writer remembers that after he had passed the three score years and ten, which is the allotted life of man, he was still capable of climbing several thousands of feet in the Alps or Pyrenees in search of his beloved butterflies.

It was perfectly marvellous only a few years ago to see him thread the motor traffic in the busiest parts of London, it was his frequent custom to cross a stream of traffic, leaving his friends to keep up with him if they could: very often they couldn't!

At the Entomological Society meetings at Chandos Street he would remain in conversation with friends until he had only just time to catch his train at London Bridge; he would then leave, walking at something nearer four miles per hour than three, and if he thought the occasion required a sharp run would follow, he would rush up stairs and down stairs in the tubes, jump into trains in motion, and do all sorts of things with impunity that would be impossible for most men much his junior.

He had a very happy, genial disposition and was very sociable provided his company was congenial. His conversation in its lighter vein was full of fun and repartee, and sallies were always accompanied by the merriest of twinkles in his shrewd, kindly grey eyes.

In December, 1919, he, who had always enjoyed the very best of health, was attacked by a serious illness. His great strength of constitution and lifelong temperance enabled him to partially recover from this, and he was enabled to continue research work until the day before the end came. His illness was borne with characteristic fortitude and hopefulness.

"The Doctor" rests in the graveyard of the old church at Reigate, amidst the beautiful Northdown country he had wandered over so often and loved so well. May the greenclad turf lie lightly upon him! We shall not see his like again!

To his sisters, the Misses Chapman, who resided with him, we desire to tender our very respectful sympathy.

W. G. S.

WE regret to state that Mr. W. Purdey, of Thanet Gardens, Folkestone, died on January 19th last.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of each MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—*Athalia*, *Polychloros*, *Paniscus*, and many others. *Desiderata.*—Fine female *Davus* and a few others.—*B. W. Adkin*, 8, *Hope Park*, *Bromley*, *Kent*.

Duplicates.—*Cerago*, *Silago*, *Plecta*, *Segetum*, *Xanthographa*, *Palleus*, *N. c-nigrum*, *Solidaginis*, *Decolorata*, and *Doubledayaria*. *Desiderata.*—*Porata*, *Trilinearia*, *Pendularia*, *Heparata*, *Atomaria*, *Piniaria*, *Juniperata*, *Comitata*, *Bipunctata*.—*H. W. Baker*, 26, *Woodfield Terrace*, *Ipswich Road*, *Stowmarket*, *Suffolk*.

Duplicates.—*Blandina*. *Ægon*, *Adippe*, *Davus*, *Velleda* and var., *Plumaria*, *Minorata*, *Filigrammaria*, *Impluviata*, *Ruberata*, *Salicata*, *Flavicinctata*, *Chi* and vars., *Megacephalæ*,* *Haworthii*, *Valligera*, *Cursoria*, *Agathina*, *Interrogationis*, *Unca*, *Pulchrina*, *Rumicis*, *Atomaria* (dark), *Bidentata* vars. *Desiderata.*—Numerous.—*W. G. Clutton*, 136, *Coal Clough Lane*, *Burnley*, *Lancs*.

Duplicates from well-known collection, many in fine condition: *Aurinia*, *W-album*, *Betulæ*, *Chaonia*, *Trimacula*, *Curtula*, *Pigra*, *Anachoreta*, *Muralis*, *Coryli*, *Orion*, *Leporina*, *Rubricollis*, *Quadra*, *Lurideola*, *Aini*, *Leucophæa*, *Rumicis*, *Phragmitidis*, *Absinthii*, *Chomomillæ*, *Tripartita*, *Festucæ*, *Pulchrina*, *Moneta*, and others. *Desiderata.*—Pupæ and imago in fine condition only with full data.—*W. S. Gilles*, *The Cottage*, *Bocking*, *Braintree*, *Essex*.

Duplicates.—*Io*,* *Galatea*, *Caniola*, *Exulans*, *Rumicis*, *Suffusa*, *Pyramidea*, *Vetusta*, *Ambigua*, *Comes*,* *Nigra*, *Oxyacanthæ*, *Impura*, *Carpophaga*,* *Capsincola*,* *Moneta*, *Lunosa*, *Ligula*, *Fluviata*,* *Siterata*, *Truncata*, *Asinalis*, *H. sinuella*. *Desiderata.*—Well set renewals, local forms, or pupæ.—*P. P. Milman*, *Cyprina*, *Lower Conway Road*, *Paignton*.

Duplicates.—Ova: *P. populi*, *Antiqua*, *Silago*. Imagines: *T. rubi*, *Silago*,* *Antiqua*,* *Hyperanthus*, *Napi* (vernal), *Adustata*, *Populata*, *Baja*, *Atomaria*, *Boreata*, *Multistrigaria*, etc. *Wanted.*—Very numerous in all stages.—*Thomas Smith*, *Whiston Haves*, *Froghall*, *Stoke-on-Trent*.

Duplicates.—*Napi* (Irish), *Rhamni*, *Selene*, *Aurinia*, *Atalanta*, *Sibylla* (fine), *Galatea*, *T. rubi*, *Ægon*, *Corydon*, *Hectus*, *Crepuscularia*, *E. autumnaria*, *Advenaria*, *Multistrigaria*, *Lariciata*, *Tristata*, *Viretata* (fine), *Populata*, *Straminea*, *Cannæ* (few); *Fimbria*, *Augur*, *Cerago*, etc., etc. *Desiderata.*—*Fluctuosa*, *Depuncta*, *Venustula*, and very numerous to replace; first rate condition only.—*W. C. Wells*, 354, *Boldmere Road*, *Erdington*, *Birmingham*.

Duplicates.—*Sibylla*, *Galatea*, *Ocellatus*, *Tipuliformis*, *Rhizolitha*, *Socia* (2), *Semibrunnea* (1 fair), *Prunaria* (4 ♂s), *Roboraria* (fair ♂s), *Hastata*. *Desiderata.*—*Castrensis* ♂s, *Cucullina*, *Cribrum*, *Cinerea*, *Ravida*, *Ashworthii*, *Notata*, *Obscuraria*, *Smaragdaria* and others, also vars. and local forms.—*Harold E. Winsor*, *Kent House*, *Cranleigh*.

Specially Wanted for Research Purposes.—Fertile ova of all species of *Ennomos* except *E. autumnaria*. *Duplicates.*—Ova: *Autumnaria*, *Antiqua*. Pupæ: *Trepida*, *Bidentata* (black). Imagines: *Io*,* *Fuliginosa*,* *S. populi*,* *Carpini*, *Caja*,* *Villica*,* *Autumnaria*,* *Quercinaria*,* and others.—*G. Wynne*, 78, *Shrewsbury Street*, *Old Trafford*, *Manchester*.

TO CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-BURY, N.W. 2.

CONTENTS.

The Genus "*Amblypodia auctorum*" (De Niceville, Mocre, Swinhoe, etc.), Neo Horsfield (Lep. Rhop.), N. D. Riley, *F.E.S., F.Z.S.*, 25. Notes on the Lepidoptera of the Assynt District of Sutherlandshire, W. G. Sheldon, *F.Z.S., F.E.S.*, 30.

NOTES AND OBSERVATIONS.—*Colias edusa* migration in Cannes District, C. E. Morris, 35. Blue Spots in *Chrysophanus phlaeas*, C. E. Morris, 36. *Colias electra* and *C. lesbia* ? : Preponderance of Pale Form, Dudley Westropp, 36. *Colias edusa* in South Devon, G. Hanson Sale, 37. Food-Plants of *Callophrys avis* and *Celastrina argiolus*, H. Rowland-Brown, 38. *Eromene ocella*, etc., in Lancashire, Albert E. Wright, 38. *Pyrameis atalanta* in December, J. M. Jaques, 38. The Pupal Habit of *Telea polyphemus*, Geo. C. Griffiths, *F.E.S.*, 38. Vitality of *Brenthis euphrosyne*, G. Hanson Sale, 39. *Sympetrum scoticum*, Don., in Dorset, F. H. Haines, 39. Some Notes on the Habits of ♂ *Tabanidæ*, Hugh Jones, 40.

SOCIETIES.—Lancashire and Cheshire Entomological Society, 42.

RECENT LITERATURE.—Insect Transformation, 43. The Lancashire and Cheshire Naturalist, 44.

OBITUARY, 44.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*February 1st.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, February 9th*, Ordinary Meeting at 7 p.m. *Thursday, February 23rd*, Lantern Evening at 7 p.m.—*Hon. Sec.* STANLEY EDWARDS, *F.L.S., etc.*, 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec.*, W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

subscriptions for 1922 (12s.) are now due and should be sent to R. South,
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.

Vol. LV.]

MARCH, 1922.

[No. 706.

THE

ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.



WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of

British, Continental & Exotic Lepidoptera

and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

WANTED AT ONCE.—Hundreds of *Lycæna belargus* ♂, *Corydon* ♂, *Euchloe cardamines* ♂, and *Vanessa io* ♂ or ♀. Also a few *Thecla rubi* and *Lyc. arion*. Will give cash or exchange. Can offer Californian or Tropical Butterflies. Dealers or collectors of butterflies in India, Java, Oceania, etc., please send list of showy butterflies.

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

LIVING PUPAE of British Lepidoptera

OFFERED BY

LEONARD TATCHELL, Entomologist,

43 Spratt-Hall Road, Wanstead, Essex.

PUPÆ.

Each.			Each.			Each.		
Machaon, Swallowtail ..	1/-	Porcellus, Small Elephant	1/-	Carpini, Emperor ..	5d			
Ligustri, Privet Hawk ..	4d.	Fuciformis, Bee Hawk ..	8d.	Furcula, Sallow Kitten	7d			
Ocellatus, Eyed Hawk ..	3d.	Bembeciformis, Hornet		Bifida, Poplar Kitten	7d			
Populi, Poplar Hawk ..	2d.	Clearwing ..	9d.	Vinula, Puss Moth ..	3d			
Tiliæ, Lime Hawk ..	4d.	Lanestres, Small Eggar ..	2d.	Bicuspis, Alder Kitten	5/-			
Elpenor, Elephant Hawk	3d.	Versicolor, Kentish Glory	8d.	Fagi, Lobster Moth ..	1/-			

Postage 4d. extra.

Write for Lists of CABINETS, APPARATUS & SET SPECIMENS.

THE ENTOMOLOGIST.

VOL. LV.]

MARCH, 1922.

[No. 706

THE FOSSIL SAWFLIES OF FLORISSANT, COLORADO.*

By T. D. A. COCKERELL.

THE sawflies, owing to their position near the base of the Hymenopterous series, are of more than ordinary interest to the evolutionist. Primitive Siricoids are known from far down in the Mesozoic, but, except at Florissant, tertiary sawflies are rare. The remarkable Oligocene deposit at Gurnet Bay, in the Isle of Wight, has produced a long series of Hymenoptera, but not a single sawfly. In the famous Miocene deposit at Oeningen in Baden a few species have occurred, only three of them described and named. Others are known from the Oligocene of Aix, Brunstatt and in Baltic amber, and the Miocene of Radoboj, but the species are few and for the most part inadequately known. A primitive Siricoid of large size, preserved in the British Museum, has been described from the Eocene of Bournemouth.

It is only in the Miocene of Florissant that we have a fairly representative extinct sawfly fauna. No less than forty-two species have been described, referable to twenty-four genera. Ten of the genera have been regarded as extinct, *Pseudocimbex*, Rohwer, and *Phenacoperga*, Ckll., being placed by Rohwer in a sub-family—Phenacoperginæ. The remaining genera are typical Nearctic and Holarctic types, without any suggestion of Neotropical affinities. They are *Janus*, *Megaxycla*, *Neurotoma*, *Hemichroa*, *Dineura*, *Pteronus*, *Eriocampa*, *Pseudosiobla*, *Macrophya*, *Tenthredella*, *Schizocerus*, *Selandria*, *Cladius* and *Eriocampoides*. It is evident that the modern sawfly genera have come down practically unaltered from the Miocene, but many genera once associated with them have died out.

The genus *Cimbex* and a new species of *Eriocampa* may now be added to the Florissant list, the specimens being in the Colorado Museum of Natural History in Denver. I am indebted to Director J. D. Figgins for permission to describe them. A *Cimbex* larva was reported by Menge as occurring in amber, but otherwise the genus has not been known fossil.

* Sawflies are known as Hymenoptera Phytophaga, but the adults have been found in the act of devouring other insects. Thus at Brainerd Lake, Colorado, I found *Labidia alienata*, Rohwer, preying upon *Bibio nervosus*, Loew (det. Aldrich).

Among the fossils received from Mr. Figgins, I also found the third known specimen of *Megaxycla petrefacta*, Brues (14 mm. long), and the second known example of the caterpillar *Phyllestes vorax*, Ckll.

Cimbex vetusculus, n. sp.

Male. Length 17.3 mm., of the usual form, with the stout hind legs projecting from the sides of the abdomen; head, thorax, abdomen and legs black; wings hyaline, suffused with brown in the vicinity of the stigma, veins dark brown. Compared with a male *Cimbex americana*, Leach, from Boulder, Colorado, there is little difference except in size. The interradius is more oblique in the fossil, and the second recurrent nervure does not meet the transverse-cubital, but ends some distance before it. I find, however, that some recent specimens have the second recurrent distinctly before the first (morphologically second) transverse-cubital. The scanty hair on the body agrees with *Cimbex* and not with *Trichiosoma*.

Wing measurements in microns: lower side of radial cell from interradius to apex, 3170; radial cell on second (morphologically third) cubital, 960; end of second recurrent nervure to first intercubitus (transverse-cubital), 590; end of first recurrent nervure to end of second, 1455; lower side of first discoidal cell, 1690; lower end of basal nervure basad of nervules, 95.

Eriocampa disjecta, n. sp.

Length 11 mm., anterior wing 7 mm.; head and thorax black; abdomen narrow, ferruginous, with the last two segments darkened; wings clear, stigma and nervures ferruginous. Compared with Macgillivray's figure ('Proc. U.S. Nat. Mus.,' vol. xxix, pl. 28) of *E. ovata*, L., it differs thus: radial cell longer and more tapering, its lower side before apex gently curved inward; interradius curved; distance between basal nervure and nervules greater; third cubital cell narrower in proportion to its length; anterior and posterior sides of first discoidal cell nearly parallel, slightly converging above, but basal side (basal nervure) considerably longer than apical; first discoidellian (hind wing) considerably longer.

Among the fossils it is nearest to *E. pristina*, Ckll., which is about the same size and similarly coloured, but the apical part of marginal cell is much more produced than in *pristina*, and there are many other differences in detail. They agree in having the third intercubitus arched inward.

Wing measurements in microns: upper side of radial cell from stigma to apex, 2120; lower side of radial from third intercubitus to apex, 1185; lower end of interradius to third intercubitus, 255; second intercubitus to lower end of interradius, 690; upper side of second cubital cell, 960; depth of stigma, 430; first cubital on first discoidal, 415; second cubital on first discoidal, 350; second intercubitus to second recurrent, 400; basal nervure, 1120; apical side of first discoidal, 605; first discoidal on submedian, 445; first discoidal on first brachial, 620.

THE GENUS "AMBLYPODIA" AUCTORUM (DE NICEVILLE, MOORE, SWINHOE, ETC.), NEC HORSFIELD (LEP. RHOP.).

BY N. D. RILEY, F.E.S., F.Z.S.

(Continued from p. 29.)

(g) *H. n. batjana*, ssp. nov.

♂. Upperside: Somewhat similar to *plateni*, the distal black border being very broad; its inner edge, however, is very much curved (not nearly straight as in *plateni*), and it does not extend at all into the basal portions of areas 4, 5, 6 or even 7. On the hind wing the blue reaches partly into area 6. The underside is distinctly greenish.

B.M. type No. Rh. 205, ♂; Batchian (*Dr. Platen*), ex Godman and Salvin Coll.

Very distinct from the next species (*H. annetta*), which was also obtained from Batchian by Dr. Platen. Its genitalia are decidedly of the *narada* type.

(h) *H. n. confusa*, ssp. nov.

♂. Upperside: The blue is much thinner and paler and is restricted on the fore wing to the cell, the proximal quarter of area 2, the proximal two-thirds of area 1*b* and the whole of 1*a*; on the hind wing it occupies the cell, the bulk of area 2 and most of the proximal halves of areas 3 to 6. The underside is light, glossy purplish brown, the diagonal line prominent, very wavy.

B.M. type No. Rh. 206, ♂; Macassar, ex Hewitson Coll.

This specimen very closely resembles the next species in colour and markings and in the great reduction of the blue areas of the wings; in fact, it stood as *annetta* in the collection. Its genitalia, however, show it unquestionably to belong to *narada*.

(3) HORSFIELDIA ANNETTA, Staud.

The oblique transverse line on the underside of fore wing in this species does not run to the apex, but towards the costa some little way short of the apex, though seldom, if ever, actually reaching the costa.

(a) *H. a. annetta*, Staud.

Amblypodia annetta, Staud.

Typical *annetta* was described by Staudinger from examples sent him by Dr. Platen, and he gives an excellent figure of it (Ex. Schmett, pl. 96). It is characterised by the small area occupied by the rather *purplish* blue of the upper side, and its extremely dark underside, against which the grey marginal and submarginal bands of the hind wing show up very conspicuously. Any of these characters will at once separate it from *H. n.*

batjana, the Batchian race of *narada* which was also obtained by Dr. Platen.

Only known from Batchian.

(b) *H. a. elga*, Frühst.

Described from Obi. It is said to have a more brilliant and larger light blue basal area to all wings, and a light red-brown underside. It is unknown to me.

(c) *H. a. anna*, Staud.

The male has less and much lighter blue than typical *anna* on the upperside. On the underside the grey bands on hind wing are slightly more prominent, and the diagonal line which runs across both wings is very wavy and comparatively conspicuous; in typical *annetta* it is scarcely visible. The ground-colour of the underside is very uniform dark brown.

This race was described from Amboina and Saparua. It is in the British Museum from Ceram only.

(d) *H. a. fabiana*, Frühst.

This race was described from a solitary female from Waigiu. It is represented by one female from Salwatty in the British Museum.

It is said to "connect *annetta* with *faisina*" (from the Solomons!), than which the "blue of the upperside is rather darker and more sharply defined. Underside: Ground-colour light grey, with a broad red-brown wavy median band. Both wings with a complete black submarginal band which, on the hind wing, is proximally strewn with whitish-grey. The ante-marginal brown spots of the hind wing more delicate than in *faisina*, the subanal spots grey, instead of dull yellow, and larger."

(e) *H. a. eberalda*, Frühst.

All the males of this race that I have seen are very brilliant blue above, the blue being of much the same shade as in *anna*, rather light (very much lighter than in typical *annetta*), and of considerable extent; underside very dark purplish-black, on which the wavy diagonal line is barely visible; of the grey markings towards hind margin of hind wing the inner series is the more prominent. The underside may, however, be bright red-brown, in which case the normal markings are quite prominent. Frühstorfer describes the female as being "above like *narada fara*, but darker blue, basal coloration of the hind wing almost reaching the margin at anal angle. Underside rather lighter, more reddish-brown, more richly sprinkled with grey."

Described from the high Forest of Kabenau, German New Guinea; occurs also in Dutch New Guinea, Kaju-mera, Fak-Fak, and probably throughout New Guinea.

(f) *H. a. faisina*, Ribbe.

Based on a single female taken on Faisi Island in the Bougainville Straits, Solomon Isles. It is remarkable for the very light distal half of both wings below, and the pronounced marginal markings on the hind wing. The upperside appears to agree quite well with *a. anna* female. It is not represented in the British Museum; it probably is a good local race.

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 35.)

Aglais urticae.—Larvæ abundant at Lochinver. The imagines bred are of good size and extremely bright in colour, the tawny disc of the wings being especially bright. The most striking feature in this race is, however, the brilliance and size of the blue blotches in the dark external band; this character, especially as it applies to the superiors, is more pronounced than in any specimens I possess either of British or European origin.

Pyrameis cardui.—One or two visitors at Lochinver in June.

P. atalanta.—One example around nettles at Inchnadamph.

Argynnis aglaia.—Common at Lochinver, less so at Inchnadamph. Some of the females resemble south of England specimens, and some are very dark.

Brenthis selene.*—Fairly common.

Hipparchia semele.—Common at Lochinver and on the Island of Soyea, but very difficult to capture in consequence of its wariness and the rough character of the ground it frequented; very fine bright examples of race *scota* Verity.

Epinephele jurtina.*—Unquestionably the most interesting butterfly met with. My first specimen taken at Inchnadamph on July 5th gave me quite a shock. A large, apparently jet black butterfly got up and flew with a very *Erebia*-like flight; I wondered if I had come across *E. ligea*, which certain people consider a not impossible species to occur in western Scotland. The wind carried the insect some half a mile before I could capture it and solve the mystery. I found it was a very dark male *E. jurtina*, and afterwards captured one female, very much like our south of England form, except that the dark portion of the wing was darker than obtains in that race; the fulvous patch was confined to the disc of the superiors. At Lochinver the form is a really astonishing one if one considers the geographical position. Both males and females are very

strongly coloured, and in the latter the fulvous patches spread over almost the entire superiors, and there is even a band of this colour across the inferiors. Some of the specimens resemble very closely examples I have from Spain and southern France, and are practically identical with *ab. hispulla*, Hüb. I am aware, of course, that the Scilly Islands produce a very similar form, but Lochinver is several hundreds of miles further north!

Coenonympha tiphon.*—Common throughout the district on bogs; the usual highland Scotch form.

C. pamphilus.*—Not infrequent at Inchnadamph; hardly seen at Lochinver. The examples brought home are very typical of southern British specimens, and do not show any approach to race *scota* Verity.

Polyommatus icarus.*—Fairly common at Lochinver and on Soyea, less so at Inchnadamph. The examples from the latter locality (males only) show distinct traces of black spots on the uppersides of the inferiors; this does not apply to the Lochinver specimens. The males and some of the females of these are of an extremely bright blue, almost rivalling *Agriades bellargus* in this respect. The blue coloration in some of the females is extremely pronounced. The undersides are typical. The size is, as in most Scotch specimens, larger than southern British.

Cerura furcula.—Larvæ beaten by Mr. Whittle from sawallow at Lochinver.

Notodonta dromedarius.—Larvæ on birch; Mr. Whittle; Lochinver.

Pygaera pigra.—Larvæ extremely common on sawallow at Lochinver, at the end of July.

Palimpsestis or.—Larvæ on aspen at Lochinver; not uncommon.

P. duplaris, var. *obscura*, Tutt.—Common at sugar.

Polyphoca flavicornis.*—Larvæ scarce in both localities, imagines not yet bred.

Trichiura crataegi.—We each obtained a larva at Lochinver on sawallow. Mine has not emerged.

Lasiocampa quercus, var. *callunae*.*—Larvæ on heather.

L. rubi.—Larvæ at Lochinver.

Saturnia pavonia.*—Larvæ common on heather at Lochinver, less so at Inchnadamph.

Drepana lacertinaria.—Larvæ at Lochinver; Mr. Whittle.

Parasemia plantaginis.*—At each locality. Scarce.

Acronycta menyanthidis.—One larva on *Myrica gale* at Lochinver, now a pupa.

A. euphorbiae, var. *myricae*.—One ichneumonid larva at Lochinver.

A. rumicis.—At sugar, the type form.

Agrotis strigula.—Common amongst heather at dusk.

Noctua augur.—At sugar.

N. brunnea.—Common at sugar; a beautiful reddish form, = var. *rufa*, Tutt.

N. c-nigrum.—At Lochinver; Mr. Whittle.

N. primulae, Esp., = *festiva*, Hb.—Common at sugar. The specimens were reddish-brown unicolorous forms showing little variation.

N. rubi.—Common at sugar.

N. xanthographa.—One dark example at sugar, July 14th—a very early date.

N. plecta.—Common at sugar; the examples have the costal streak darker than is the case in southern specimens.

Triphaena comes.—Two examples only at sugar, one a bright pale red = var. *rufescens*, Tutt, the other = var. *ochrea*, Hufn.

T. pronuba.—Common at sugar. Various forms; particulars not noted.

Mamestra pisi.—One example only at sugar, = var. *pallida*, Tutt.

Eumichtis adusta.—At sugar; = the type form.

Bombycia viminalis.—Larvæ not uncommon on sallows at Lochinver; the resultant imagines are very beautiful and highly variegated forms perhaps near *intermedia*, Tutt, but I have never seen similar specimens.

Hyppa rectilinea.—Scarce at sugar; very beautiful dark examples of var. *virgata*, Tutt.

Miana fasciuncula.—Scarce at sugar; the red form = type, and var. *cana*, Stgr., and intermediates.

Xylophasia rurea.—This, the most interesting *Noctua* met with, was common at sugar; a very variable series was taken, consisting of the greyish-white type, and the following aberrations: *ochrea*, Tutt; *flavo-rufa*, Tutt; *alopcurus*, Esp.; and *nigro-rubida*, Tutt. Of this form Tutt writes ('British Noct. and their Varieties,' vol. i, p. 81): "I have only seen this variety from the Island of Lewis."

X. lithoxylea.—One example at rest on a post in the daytime, Lochinver.

X. monoglypha.—This variable species was abundant at sugar, but the forms were not so dark on the whole as one expects to be the case in examples from Northern Scotland. I saw, perhaps, half a dozen black specimens, and the great bulk were the light southern form = the type; there was a considerable number of ab. *brunnea*, Tutt. I brought away two examples which do not agree with anything described by Tutt, or that I have seen elsewhere. They are very handsome, extremely dark variegated forms, but the ground-colour is a rich intensely dark brown. Very similar to that of *Crymodes exulis*, var. *assimilis*, but even more intense and brilliant than obtains in that form.

Polia chi.—Mr. Whittle reported this species from Lochinver; the grey type only.

Euplexia lucipara.—Common at sugar.

Hydraecia micacea.—Reported by Mr. Whittle.

Rusina tenebrosa.—Common at sugar; var. *obscura*, Tutt, only.

Taeniocampa gothica and *T. stabilis.*—Larvæ of both these species were beaten commonly at Lochinver.

*T. gracilis.**—Larvæ common on *Myrica gale*.

X. silago.—Reported by Mr. Whittle; Lochinver.

Calocampa vetusta.—A larva found on *Myrica gale* at Lochinver.

Anarta myrtilli.—Flying over heather at Lochinver.

*Prothymnia viridaria.**—Not common.

Plusia pulchrina.—Lochinver; *P. gamma,** common.

P. interrogationis.—At Inchnadamph; very local, and not common.

Hypena proboscidalis.—Lochinver; Mr. Whittle.

*Acidalia fumata.**—Common.

Ortholitha limitata.—Lochinver.

Odesia atrata, Anaitis plagiata.—Common locally at Lochinver.

Cheimatobia brumata.—Larvæ; Lochinver.

Lygris testata.—Bred from sallow; Lochinver.

*L. populata.**—Not common, and strictly typical.

Cidaria fulvata.—Lochinver; Mr. Whittle.

*C. corylata.**—Not common; the type only seen.

*C. truncata.**—Perhaps the most abundant Geometer. Very common on rocks and trees everywhere; the forms consisted of the type, ab. *perfusca*, Haw., ab. *centumnotata*, Schulz., and one or two others.

C. immanata.—Lochinver; Mr. Whittle; the type form only.

C. miata.—Lochinver; bred from birch.

Thera obeliscata.—Lochinver; common.

T. cognata.—This species was reported as common by Dr. Beveridge at Lochinver. We searched in every direction for bushes of juniper but for a long time without success. Eventually, however, I located three or four small ones on a hill behind the Culag Hotel, and on these the larvæ were common. I presume the juniper has been almost grazed out of existence.

*Coremia munitata.**—A few examples only.

*C. ferrugata.**—Very beautiful forms of ab. *spadicearia*, Haw., were not uncommon.

C. designata.—Lochinver.

Amoebe olivata.—Lochinver.

*A. viridaria.**—Beautiful brilliant green forms, very abundant.

Malenydris salicata.—Lochinver; not common.

*M. didymata.**—Abundant.

*Venusia cambrica.**—Not common on trunks of mountain ash.

*Entephria caesiata.**—Abundant; very light forms.

E. flavicinctata.—Lochinver; not common. Its usual food-plant, *Saxifraga aizoides*, is not found there, and the larval pabulum was no doubt *Sedum* sp.

Xanthorhœ montanata.*—Common and very variable; some of the forms resemble ab. *shetlandica*, Weir.

X. fluctuata.—I only saw one example at Lochinver; this is a very dark example of ab. *neapolisata*, Mill.

X. galiata.—One example only; Lochinver, Mr. Whittle.

X. sociata.*—Abundant; not showing any approach to the Hebridean form *obscurata*, South.

X. tristata.—Lochinver, not common; a black and white form resembling the Yorkshire specimens, and not the smoky brown ordinary Scottish form.

(To be continued.)

NOTES ON BRITISH NEUROPTERA IN 1921.

BY W. J. LUCAS, B.A., F.E.S.

As Neuroptera were not persistently worked for during 1921, not many records were made, and those that follow were often noted chiefly for the sake of the dates.

Alder-flies.—Two males of *Sialis lutaria*, Linn. were taken in the New Forest on May 18. The dusky *S. fuliginosa*, Pict., which is a less common and somewhat later insect, I met with first on June 1 at Blackwater in the New Forest. South took *S. lutaria* on June 1 at Harefield in Middlesex, and on the 14th at Padworth in Berks.

Brown Lacewings.—My first capture of the antlion-like *Osmylus chrysops*, Linn. was made at Queen's Bower in the New Forest on June 5, though I possibly saw one in the Forest about three weeks earlier. Two or three further examples were met with near Blackwater on June 8. These were all I saw during the season of an insect which I hoped to meet with more freely. *Hemerobius micans*, Oliv. was taken near Withybed Bottom at Stony Cross Plain in the New Forest on Aug. 4. My first experience with *H. stigma*, Steph. in 1921 occurred on Jan. 13, when one was captured flying on Esher Common, Surrey; another was taken there on Jan. 24. About twelve were secured on Jan. 30, when I visited the Common again with C. L. Withycombe; these were obtained by tapping small Scotch Firs over a beating-tray. On Feb. 4 a male was taken on Esher Common. On Feb. 21 two were beaten from Scotch Firs on the same common, and on March 10 one only was captured there in the same way. On March 22 I visited Stanmore Common, Middlesex, with South. Only one Conifer was met with, but from this a few examples of

Hemerobius were beaten; though of a rather dark and well-marked form, I take them all to be *H. stigma*.

On April 4 I obtained a *Hemerobius* larva from a Scotch Fir on Esher Common. In colour the thorax was bluish-white, with two small semilunar black marks, one on each side of the pronotum. The abdomen was yellowish-white with two longitudinal rows of dark blotches—one on each side—and a fine mid-dorsal black line. The larva was placed, with some Scotch Fir aphides, in a glass-bottomed box, where it began to spin up on April 6. Though the pale yellow cocoon, made between two "needles," was very thin, I could not tell when the larva became a pupa, but I think not at once. A nice imago of *H. concinnus*, Steph. appeared during the daytime on May 2. The pupa, of course, leaves the cocoon before the final change, and in this case did so without revealing clearly the place of exit. The pupal skin was a very perfect one. South captured this species at Padworth on June 12.

Green Lacewings.—*Chrysopa tenella*, Schn. was captured at Brondesbury, Middlesex, on June 1 (South). *C. vulgaris*, Schn. was met with three times in the New Forest—on July 15 and 25 and on Aug. 31. Of *C. prasina*, Ramb. (= *aspersa*, Wesm.) one was taken at Esher Common on June 14 and two on June 22. Withycombe took his first specimen of the blue-green species, *C. perla*, Linn. on May 21; I captured specimens on June 16 in Juniper Valley, Boxhill, Surrey. South secured two *Nothochrysa capitata*, Fabr. on or near Guelder Rose, *Viburnum opulus*, Linn. at Padworth on June 12.

Dusty-wings.—I have but one note on these tiny Neuroptera with powdered wings—a capture of *Semidalis aleurodifformis*, Steph., on the wing at Ramnor in the New Forest on June 5.

Scorpion-flies.—My first experience of the genus *Panorpa* was on May 23, when a female *P. germanica*, Linn. and a teneral female *P. communis*, Linn. were captured in the New Forest. By the 24th they seemed to be common, and a male *P. communis* was taken, a male *P. germanica* being secured on May 29. On May 31 *Panorpas* appeared to be very plentiful in the Forest, as they were again on June 5. Their flight is usually clumsy and of short duration, often nearly in a straight line. They quickly fly off, or drop, when disturbed. On July 25 at Denny Bog a female *P. communis*, a large and bright specimen but with wing-tips damaged, when disturbed went down into the rank herbage, and being followed tried persistently to hide in the deep grassy growth at the base of the taller herbage—a frequent proceeding of this species and its congener *P. germanica*. South took males of *P. communis* and *P. germanica* at Padworth from June 12–14.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 3.)

PROCTOTRYPES, Latreille.

Proctotrupes, Latr., Prec. Car. Gen. Ins., 1796, p. 108 ;
Serphus, Schr., Schrift. Berl. Ges., i, 1780, p. 307 (*nec. Syrphus*,
Fab., 1775).

This genus as restricted nowadays occurs in Africa, Australia, Chili, and both North and Central America ; I have seen none from India. It has been divided into three subgenera by Kieffer, who considers them probably worthy of generic rank ; I do not. The species are very distinct *inter se*, and easy of determination ; in fact, until the structure of the claws be examined they are less different from those of *Exallonyx* than from each other. They appear to occur ubiquitously and with no reference respecting situation ; I have never, or extremely rarely, found them upon flowers, but usually by beating boughs and sweeping rank herbage ; though most frequently they are attracted by honey-dew upon the leaves of oaks, and particularly of limes.

TABLE OF SPECIES.

- | | | |
|-------|-----|---|
| (10). | 1. | Abdominal petiole not visible from above ; metanotum smooth with more or less distinct areae ; terebra filiform [CRYPTOSERPUS, Kieff.] |
| (9). | 2. | Radial cell as long, or nearly so, as stigma. |
| (6). | 3. | Metanotum basally trifoveate ; hind calcar short, always straight. |
| (5). | 4. | Pronotal tubercles small ; metanotum without areae. |
| | | 1. <i>brevimanus</i> , Kief. |
| (4). | 5. | Pronotal tubercles acute ; metanotal areae entire. |
| | | 2. <i>laricis</i> , Hal. |
| (3). | 6. | Metanotum not foveate ; larger hind calcar long, often arcuate. |
| (8). | 7. | Radial nervure straight ; notauli slightly indicated. |
| | | 3. <i>longitarsis</i> , Th. |
| (7). | 8. | Radial nervure curved ; notauli utterly wanting. |
| | | 4. <i>aculeator</i> , Hal. |
| (2). | 9. | Radial cell much shorter than stigma ; body squat. |
| | | 5. <i>parvulus</i> , Nees. |
| (1). | 10. | Abdominal petiole distinct, visible above ; metanotum entirely sculptured. |
| (16). | 11. | Propleuræ usually striate ; abdomen or second segment entirely red ; terebra filiform, at least half abdominal length [SERPHUS, Kieff.] |

- (13). 12. Metathorax reticulate ; terebra apically deflexed.
6. *gravidator*, Linn.
- (12). 13. Metathorax longitudinally striate ; terebra evenly arcuate.
- (15). 14. Wings aborted ; large hind calcar straight.
7. *devagator*, Oliv.
- (14). 15. Wings fully developed ; large hind calcar arcuate.
8. *gladiator*, Hal.
- (11). 16. Propleuræ smooth, basally punctate ; second segment black or piceous. rarely apically rufescent ; terebra gradually attenuate throughout, shorter than half abdomen [PHÆNOSERPHTHUS, Kieff.].
- (20). 17. Metathorax centrally sulcate throughout its length.
- (19). 18. Head transverse, as broad as thorax ; cheeks dentate. -
9. *buccatus*, Thoms.
- (18). 19. Head globose, shorter than thorax ; radial cell acute.
10. *elongatus*, Hal.
- (17). 20. Metathorax centrally carinate throughout its length.
- (26). 21. Frons apically convex ; radial cell fully length of stigma.
- (25). 22. Metanotum evenly rugose ; discal nervures indicated.
- (24). 23. Wings normally developed ; abdomen entirely black.
11. *calcar*, Hal.
- (23). 24. Wings aborted ; central segments often brunneous.
12. *curtipennis*, Hal.
- (22). 25. Metanotum rugose, basally smooth ; discal vein wanting.
13. *seticornis*, Th.
- (21). 26. Frons produced ; radial cell much shorter than stigma.
- (28). 27. Metathorax tuberculate ; head globose ; legs infuscated.
14. *fuscipes*, Hal.
- (27). 28. Metathorax mutic ; head distinctly transverse ; legs rufescent.
- (32). 29. Frons tuberculiformly prominent between antennæ.
- (31). 30. Head transverse ; flagellar joints long, not cylindrical.
15. *pallidipes*, Jur.
- (30). 31. Head and flagellar joints quadrate, latter cylindrical.
16. *hyalinipennis*, Morl.
- (29). 32. Frons deplanate and not prominent between antennæ.
- (34). 33. Stigma twice length of radial cell ; discal nervures wanting.
17. *micrurus*, Kieff.
- (33). 34. Stigma thrice length of radial cell ; discal nervures indicated.
- (36). 35. Legs of normal length ; metanotum evenly rugulose.
18. *viator*, Hal.
- (35). 36. Legs elongate ; metanotum triangularly smooth basally.
19. *Chittii*, Morl.

(To be continued.)

NOTES AND OBSERVATIONS.

THE ORDER NEUROPTERA.—It would be of much interest to myself and some other entomologists in New Zealand if a brief statement were made through the pages of the 'Entomologist' as to what extent the breaking up of the old Order Neuroptera into a number of new Orders is generally approved by British entomologists. In the 'Cambridge Natural History' the Order Neuroptera is dealt with in the broad sense, and is subdivided into families in accordance with the system followed by most of the older entomologists. Recently, however, attempts have been made to raise most of these families to ordinal status and to give them new names. For example, we find the Perlidæ spoken of as the Order Perlaria; the Ephemeridæ as the Order Plectoptera; the Sialidæ as the Order Megaloptera; the Panorpidæ as the Order Mecoptera, and so on. The Phryganidæ have of course long been regarded by many writers as a distinct order, the Trichoptera and the Dragonflies as another Order—the Odonata, although even in these cases opinion does not appear to be by any means unanimous. It is almost impossible for workers out here to discriminate between the views of one or two special students and those of entomologists in general, and hence some authoritative statement on the questions I have raised would be very welcome. Incidentally, I gather from the writings of Mr. Lucas in your pages that the old Order Neuroptera has not been entirely abandoned, and also that the old family designations appertaining thereto are still in current use amongst British entomologists.—G. V. HUDSON; Wellington, New Zealand.

[In vol. xlii, 1909, will be found an article by Dr. D. Sharp, giving a scientific scheme of the natural orders of insects, and since that time it has been the one employed by the 'Entomologist' in its index, etc. In this scheme the heterogeneous Neuroptera of Linnæus is broken up into its natural divisions. This scheme is in the main that proposed by Dr. Shipley in 'Zool. Anz.,' xxviii, 1904, and, as it is made use of in Prof. Sedgwick's 'Text-book of Zoology,' vol. iii, 1909, it has practically the sanction of Cambridge biologists. Dr. Sharp, we know, would like to amend the list of Orders in his 'Insecta' if only the publishers would produce a new edition. Since 1909 Mr. Lucas has always used the term Neuroptera in its restricted sense, and we would very much like all our contributors to do the same. We append the list of Orders:

APTERYGOTA:

Protura	} Wingless insects supposed to have descended from wingless ancestors.
Collembola	
Campodeioidæ	
Thysanura	

ANAPTERYGOTA:

Mallophaga	} Wingless insects whose ancestors were probably winged.
Anoplura	
Siphonaptera	

EXOPTERYGOTA :

Orthoptera
 Plecoptera*
 Psocoptera
 Zoraptera
 Isoptera
 Embioptera
 Ephemeroptera
 Paraneuroptera
 = Odonata
 Thysanoptera
 Hemiptera

} Winged insects whose wings develop outside the body.

ENDOPTERYGOTA :

Neuroptera
 Trichoptera
 Lepidoptera
 Coleoptera
 Strepsiptera
 Diptera
 Hymenoptera

} Winged insects whose wings arise as invaginations of the hypodermis, and for a time project within the body.

It will be noticed that Protura and Zoraptera have been added to the list of 1909, and Dr. Chapman suggests a small Order, Zeugoptera, between the Trichoptera and Lepidoptera. Some biologists prefer to separate the earwigs from the Orthoptera as Dermaptera; and some would still further reduce the Neuroptera by breaking off the Scorpion-flies, etc., at one end, as **Mecoptera**, and a group containing the alderflies and others, as **Megaloptera**, from the other.—W. J. L.]

LEUCANIA VITELLINA REARED FROM OVA.—In October, 1920, Mr. L. W. Newman sent me some ova of *L. vitellina*. These hatched the same month and I placed the larvæ on *Poa annua*. I kept them in my sitting-room, where there was generally a fire every evening. They did not attempt to hibernate, but fed right through the winter. As they got larger I moved them into a large pan in which I put a pot of Cocksfoot grass. I had potted up a number of small tufts of this grass, which I brought on in the greenhouse, and I used to change the food every other night. When forcing this species in a dry room it is advisable to have the grass slightly damp, as when changing their skins the larvæ have difficulty in getting out of them. It is not a good plan to sprinkle them with water otherwise they go off. The grass, being grown in a damp greenhouse, is moist enough. They had all pupated by the middle of April, 1921; the first emergence was on May 18th and the last on June 8th. They always emerged in the early morning. Almost the whole brood were males and all large specimens.—H. McD. EDELSTEN; Oakhurst, Balcombe Road, Haywards Heath.

EARLY AND LATE DATES FOR LEPIDOPTERA.—The following dates of appearance of certain species of Lepidoptera in this district during the past abnormal season may be of interest: February 16th, *Selenia bilunaria* and *Eupithecia pumilata* (the last specimen seen of the

* The components of the Neuroptera (Linn.) are in block type.

latter species was on October 21st—a freshly emerged one). February 24th, *Larentia multistrigaria*; March 21st, *Pieris rapæ*; March 24th, *Pararge egeria*; April 4th, *Spilosoma fuliginosa*; April 22nd, *Melanthia ocellata*. A specimen of *Bapta temerata* was taken on October 21st and *Vanessa atalanta* was observed on the wing on December 5th and 9th. *Caradrina ambigua* was abundant at sugar during August and September, and several *Colias edusa* were seen in the autumn.—E. D. MORGAN; 27, Sanford Crescent, Chelston, Torquay.

ADDITIONS TO GLAMORGAN LIST OF LEPIDOPTERA.—A specimen of *Lithosia griseola* was taken on July 19th last year at Llanishen. Possibly this insect has been overlooked owing to its similarity to *L. lurideola*. It seems rather remarkable that the first example of *Eupithecia linariata* to be met with locally should have turned up at light on September 2nd—an unusual date for this species to be on the wing. Amongst a number of “micros” submitted to Mr. F. N. Pierce for identification in connection with the Faunistic Survey of the County the following were some of the more interesting new records: *Peronea ferrugana*, *P. hastiana*, *P. logiana*, *Rhaodia caudana*, *Ephippiphora inopiana*, *Pædisca solandriana*, *Stigmonota perlepidana*, *Adela rufimitrella* and *Depressaria angellicella*, all from Llanishen.—F. NORTON; 69, Whitechurch Road, Cardiff.

COLLECTING BY POWERFUL LIGHTS, ETC.—During the past two years I have worked this favoured district with great determination, collecting a large series of insects and filling a bulky note-book with daily observations. Most of the work has been carried out with the aid of a car and powerful headlights at Grange, Witherslack and Holker Mosses, Bigland and Cartmel Fells, and Newly Bridge. During 1921 a couple of 400-candle-power petrol vapour lamps were purchased. In regard to weather, nights varied very much. Many hot, still, muggy nights produced very little; on the other hand one wild night of westerly lashing rain gave us a “great night.” Fog is worse than an east wind. Some species, notably *D. coryli* and *G. papilionaria*, which most local collectors consider scarce, came in great numbers. *P. leucographa* and *T. miniosa*, both taken in fair numbers, are apparently a new record for the district. *D. chaonia* occurs at Bigland and *N. trepida* occurred twice on the very stormy night, May 11th, 1921. *L. polycommata* is evidently well established here. *L. viretata* is much more local in my experience, being only taken in 1920. *P. duplaris* shows great variation. Many insects absolutely ignore light; others, on two nights apparently similar, act very differently, on the one crowding right up to the light, on the other never coming within 15 feet. *Plusia moneta* was taken at dusk in 1919 and 1920 upon some eight occasions, always hovering over *Delphinium* or *Viola*, but none were seen last year. Is this a “farthest north” record? *B. bimaculata* is a scarce insect in Witherslack woods which apparently ignores light altogether. I took *M. alternata* at rest on a Pine tree at Holker, May 28th, 1920. It is known to occur at Witherslack, but is this often noted in Lancashire? The dark sepia black forms of *X. monoglypha* occur frequently (at sugar). *A. nigra*, common at sugar. *E. undulata* was

taken by myself at Grange in August, 1900, but during the past two years of hard collecting has not been seen. *A. unitaria* apparently is scarce here. My only record is July 27th, 1920, Grange. Also *A. luteata* June 17th, 1921, Holker. It is frequently necessary to get a car into apparently impossible places or to back a mile, but a doctor's car in the Lake District has to go almost anywhere, sometimes even through flowing tidal waters, or through timber-felling tracks, and I can strongly suggest that others should follow our example and try "mothing by motor." (N.B.—Witherslack is in Westmorland. Other localities all North Lancs.).—(Dr.) RICHARD C. LOWTHER; Fernleigh; Grange-over-Sands.

EMMELESIA MINORATA, ETC., AT GRASSINGTON.—I paid a short visit to Grassington on July 27th last. The day was fine but overcast; in consequence *Erebia æthiops*, though fully out, was not flying freely, but several nice specimens were taken. My chief object was to discover if *Larentia flavicinctata* still occurred in its old haunts, as it had not been seen for some time; however, it was still found on the limestone rocks, but was not numerous, about a dozen being taken. Returning over the high ground above the woods, *Aphelia osseana* was flying freely, but the best thing taken was *Emmelesia minorata*. The first specimens taken were sitting on the walls; they flew off quickly as one approached and were bad to secure, but a week later, August 3rd, they were flying over the short grass, settling on the stems or sometimes on the bare ground; this was about 5 o'clock in the afternoon—probably this is the time of their natural flight, which is very much like that of *E. albulata*. I believe this is the only recorded Yorkshire locality. *Larentia olivata* was common in the same locality, but the only other interesting insect caught was a fine *Cerostoma sequella* taken from a tree-trunk.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

NON-ATTRACTIVENESS OF ELECTRIC LIGHT: A QUERY.—Can anyone offer an explanation of a curious phenomenon which has very much puzzled me? In pre-war days the stout electric lamps here attracted a large number of moths. There was one arc lamp in particular, near by, which shed its light upon a house with a cemented front, which always produced an abundance of visitors. On the house front I would often find as many as a dozen moths late in the evening, including such species as *E. autumnaria*, *S. fagi*, *X. aurago* and *C. xerampelina*. During the war the lighting was reduced to a minimum, in consequence of which no more moths were seen at the lamps. Since the war, however, the old lighting has been restored, though with different lamps. These seem to possess absolutely no power of attraction. Not a single moth is ever found now at any of our lamps. During 1921 I only saw one moth resting on the wall of the house mentioned, and that was a ♂ *H. brumata* at the beginning of December. What is the cause of this? I have asked the electrical engineer if he can explain, but he cannot. I find the old lamps were called "Flame Arcs"; the present ones, which give a rather whiter light than the old ones, are known as "gas filled" or "half Watt" lamps. It seems to me that there must be some particular ray which was present in the old lamps that is absent in

the light produced by the present ones which was the cause of the attraction, but up till now I had been under the impression that all bright lamps were equally attractive to moths. I shall be glad if anyone can explain. One cannot imagine any change in the sensitiveness of the moths to light.—(Rev.) J. E. TARBAT; Fareham, Hants.

LEPTOGRAMMA LITERANA IN YORKSHIRE.—In reference to Mr. Sheldon's invaluable contribution to the life-history, variation and distribution of this species, it may be well to put on record that I have taken this species very sparingly over a number of years in the Kildale district of North Yorks, never more than two or three specimens in a season, all in the spring months of February, March and May; all on or about Oak except one specimen beaten out of Birch. The specimens taken included the type and var. *squamana*, the latter probably being the more frequent.—T. ASHTON LOFTHOUSE, F.E.S.; Linthorpe, Middlesbrough.

BUTTERFLIES OF THE VIENNA DISTRICT.—Being in Vienna during the latter part of the summer of 1920 I had the opportunity of spending my Sundays in the surrounding country. The neighbourhood is renowned for the beauty of its scenery and the variety of its Lepidoptera, and though one's observations were necessarily confined to the day-flying species, the results may possibly be of interest to your readers. On July 25th, a very hot, sunny day; I climbed the slopes of the Kahlenberg, which overlooks the Danube west of Vienna; the grass had not been cut in the meadows, which were a mass of wild flowers and teemed with insect life. The following were among the many species noticed: *Papilio machaon*, about six specimens more or less damaged; *Colias hyale*, a fair number, recently emerged; *Melanargia galatæa*, mostly damaged; *Satyrus dryas*, a handsome, strong-flying species of the Satyridæ, several in good condition; *Cænonympha iphis*, first cousin to *C. pamphilus*. The following "blues," recently emerged, were in large numbers, and formed a lovely sight in the brilliant sunshine: *L. corydon*, *C. minimus*, *L. ægon*, *L. meleager*, a large sky-blue species; *L. damon*, the male of which is the colour of moonlight on water, with black edging, the female dark brown, both sexes having a long white streak on the underside of the hind wings. Of day-flying moths the following were seen: *Zygæna carniolica*, a pretty species of the Burnet tribe, in very large numbers, five or six on every thistle head; *Z. filipendulæ*, *O. limitata*, *O. mæniata*, *O. bipunctaria*, the latter in enormous numbers, together with var. *gachtaria*, *P. gamma*, *E. glyphica*. On August 1st, a warm, cloudy day, I noticed the following in the woods and adjoining meadows of the Wienerwald, near Mauer: *D. paphia*, rather worn specimens; *L. sinapis*, *P. egeria*, *L. icarus*, *L. corydon*, *L. bellargus*; *L. ægon*; *Chrysophanus dorilis*, belonging to the "copper" family, the male being greyish-brown with black dots and the female somewhat similar to the female of *C. virgaureæ*; *H. malvæ*; *A. sylvanus*; also one specimen of *C. hera* sitting on a thistle. August 8th, a fine and very hot day, was spent in the pine woods above Baden, in the Wienerwald, at a height of about 800 feet above sea-level, and the following species were noticed, either flying among the pine trees or on the grass or heathery clearings on the side of the

hills: *P. podalirius*, one specimen; *L. sinapis*; *P. egeria*; *P. megæra*; *M. galatea*; *E. æthiops*, freshly emerged and in large numbers; *S. semele*; *E. janira*; *S. briseis*, a fine large species of the Satyridæ; *A. paphia*; *Lycæna hylas*, a member of the "blue" family very prettily marked on the underside. Several specimens of *C. hera* were found sitting on hazel, and I also noticed *E. atomaria*, *C. clathrata* and *P. coracina*. On August 15th we had a day's partridge shooting in the plains south-east of Vienna, over open fields of grass and maize, intersected here and there by streams lined with scrub and small woods. The weather was sunny and very hot, and the following were noticed: *P. daphidice*, freshly emerged and in large numbers; *Colias hyale*, very plentiful, including variations in marking and colouring; *C. edusa*; *C. chrysotheme*; *C. myrmidone*, all plentiful. I took one specimen of the pale female variety of the latter, which much resembles var. *helice* of *edusa*, and is far from common in Austria; *L. sinapis*, including several entirely devoid of the black tip to the fore wing; *S. briseis*; *S. hermione*; *A. lathonia*; *A. dia*, in large numbers, freshly emerged; *M. athalia*; *P. cardui*; *L. bellargus*; very plentiful, including several of the female bright blue variety *ceronus*; *L. corydon*; *C. minima*; *Lycæna argiades*; *A. comma*; *M. stellatarum*; *S. convolvuli*; *A. similata*. On several evenings during August I noticed the following in the Prater (the Bois-de-Boulogne of Vienna): *A. lathonia*; *C. minimus*; *Lycæna argiades*; *P. c-album*. On September 4th, during a day's stag shooting in the mountains of Lower Austria, *E. æthiops* was found in considerable numbers up to a height of about 3000 feet. September 12th, a sunny morning, was spent in some large woods, well known to local collectors, north of the Danube. The woods largely consist of oaks and open occasionally into marshy meadows. The following were seen: *Araschnia prorsa*, the dark summer form of *A. levana*; *V. io*; *V. urticæ*; *P. c-album*; *P. atalanta*; *A. paphia*; *A. lathonia*; *L. argiades* (plentiful); *C. virgaureæ*. On September 19th and 26th, in the same district and in hot weather, many of the same species were found as on the 12th, and in addition *P. machaon*, *C. chrysotheme* and *G. rhamni*, the latter newly emerged. *V. io* was in very large numbers. The following varieties of *L. icarus* were also taken: *arcua*; *amethystina*; *cærulea*. The usual colour of the female in Austria is dark brown with practically no blue scales on the upper side. These same woods in July are celebrated hunting-grounds for the Apaturias. *A. iris* can be taken in numbers; a friend of mine last summer had three in his net at one time. The bandless variety *iole* is by no means unknown here. *A. ilia* and its reddish variety *clytie* are also to be had, and that wonderfully handsome insect *Limenitis populi* is comparatively common. The end of September practically ended the butterfly season, and one would have to travel far indeed to find a greater variety of insects, plants and flowers, amid such charming and varied surroundings within half an hour's journey of a large capital city, as in the Vienna neighbourhood. Two insects left a particular impression on one's mind—*A. lathonia* on account of its habit of skimming low along cart tracks at the edge of woods and of settling in the ruts, and *P. c-album* on account of its tameness. The green colour of a net seems to attract it, and I have several times known it to settle on the net. It will persist in flying round and

round the same spot and settling on the same leaf or twig, as one has seen *T. rubi* do in England, and is not easily frightened away.—B. H. COOKE (Lieut.-Colonel); Naval and Military Club, Piccadilly.

NYMPHS OR NAIADS.—Mr. W. J. Lucas, in the January number, p. 5, adopts the term "naiad" for odonate nymphs, following Comstock. Tillyard, in his excellent work on dragon-flies, uses the term "larva." It may be useful to employ a special name, but "naiad" is inadmissible since it has long been in use for the freshwater mussels. Thus, for instance, Isaac Lea in 1836 published a 'Synopsis of the Family of Naiades,' and in 1900 C. T. Simpson published a 'Synopsis of the Naiades, or Pearly Freshwater Mussels.' If a special term is required for the larvæ of Odonata, possibly Odonaiad would be suitable.—T. D. A. COCKERELL.

PLATYMISCHUS DILATATUS, WESTWOOD.—On October 5th, 1920, my wife and I were walking on the beach at Ventnor, Isle of Wight, where quantities of *Fucus* and other seaweeds had been thrown up. Here and there were large boulders, and swarming over them were vast numbers of small wingless Hymenoptera, at first sight appearing to be ants. On collecting a number it was at once evident that they belonged to the Proctotrypoid series, and on looking up the literature they were readily identified as *P. dilatatus*. They undoubtedly came from Dipterous larvæ in the seaweed. The species has been considered rare, and even the British Museum had only a few species. I probably obtained more than had been secured by all collectors previously, or at any rate could easily have done so.—T. D. A. COCKERELL.

LIBELLULA DEPRESSA, LINN. (ODONATA).—It may be of interest to record that I captured, flying slowly and low up a small stream at Tibshelf, Derbyshire, a specimen of *Libellula depressa*, Linn., on August Bank Holiday, 1921. The upper part of the abdomen was covered with slate-coloured bloom, whilst underneath the abdomen was so badly eaten away (possibly by some parasite) that it was useless as a cabinet specimen.—A. W. RICHARDS; 2, Denman Drive, Newsham Park, Liverpool.

HEMEROBIUS STIGMA, STEPH. (NEUROPTERA).—Two examples of this interesting little lacewing were taken at Esher Common, Surrey, on January 30th last. As they passed by on the wing they could be at once recognised by their slow characteristic style of flight, and were easily secured even without the help of a net. Their presence in January is welcome, although they can scarcely be looked upon as harbingers of the spring, for I believe I have taken imagines in every month of the year. It would be interesting to know how many broods there are in a season.—W. J. LUCAS; February 3rd, 1922.

RESTING HABIT OF PIERIS RAPÆ.—In the evening of July 20th, when the declining sun had thrown the southward facing hedgerows into shade, I saw nine *Pieris rapæ* and one *P. napi* at rest amongst a patch of nettles. All the *P. rapæ* had chosen as resting-places nettle leaves which through some cause were bleached to a creamy white colour, remarkably similar to the colour of the butterflies. In one case there were three butterflies on one leaf, and in another case two. This would suggest that the sites had been chosen deliberately.

I think it is a fact that the dead leaves would part with their heat at the sun's declension to a much smaller extent than the living foliage, if so this would probably be the true determining factor, not the question of colour for protective purposes.—A. H. THOMPSON; 54, Church Road, Northwich.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, January 18th, 1922* (Annual Meeting).—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—Dr. Neave, one of the Secretaries, read the Report of the Council, which was adopted on the motion of Mr. T. H. Grosvenor, seconded by Mr. S. Edwards. The Treasurer then read his report and balance-sheet, which was adopted on the motion of Mr. A. E. Tonge, seconded by Dr. E. A. Cockayne. The Fellows nominated by the Council as Officers and Council for the ensuing year were declared by the President to be formally appointed. The President then delivered his address, illustrated with lantern-slides, after which a vote of thanks to him was passed with acclamation, on the motion of Mr. G. T. Bethune-Baker. A vote of thanks to the Officers was also passed on the motion of Mr. E. E. Green, seconded by Dr. C. J. Gahan.

Wednesday, February 1st, 1922.—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—The President announced the Vice-Presidents for the ensuing year to be Mr. R. Adkin, Mr. E. C. Bedwell, and Prof. E. B. Poulton, D.Sc., F.R.S., etc.—The Treasurer read a letter from the Hon. N. C. Rothschild announcing the death of Mr. W. Purdey, of Thanet Gardens, Folkestone, and a vote of condolence was passed to his relatives.—The Rev. F. D. Morice also gave a short account of the life of the late Mr. F. W. Sladen.—The following were elected Fellows of the Society: Dr. R. E. McConnell, Arua, Uganda; Dr. H. T. Fernald, Ph.D., Professor of Entomology, Massachusetts Agricultural College, Amhurst, Mass., U.S.A.; and Dr. Alfred Moore, M.D., 31, Alfred Place, South Kensington.—The President, Mr. Sheldon and Mr. Adkin all brought for exhibition some remarkable series of *Cidaria truncata*, *C. citrata* and *C. concinnata*.—Mr. F. D. Morice made a short communication on the life-history of a British sawfly, *Pristiphora pallipes*, Lep.—Mr. H. J. Turner exhibited, on behalf of Mr. Thomas Greer, a series of aberrations of British Lepidoptera from Co. Tyrone.—Mr. Ashby exhibited some butterflies from Piedmont, Italy, and said that he considered the Val di San Bartelemi, close to Nus, to be one of the best collecting grounds in northern Italy.—Mr. J. H. Durrant, on behalf of Dr. Gahan, exhibited some living examples of the Cassid beetle *Aspidomorpha sanctæcrucis* from India; the causes of the brilliant metallic coloration of this beetle were discussed by Mr. Arrow and Mr. Willoughby Ellis, and Dr. Neave commented on the habits of similar African species.—A paper by Mr. Martin E. Mosely was read on "Two New British Species of *Hydroptila*."

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*December 8th, 1921.*—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. H. Worsley-Wood, of Acton, was elected a member.—Mr. R. Adkin exhibited series of *Diaphora mendica* from co. Cork and co.

Tyrone, Ireland, pointing out that the latter differed from the Cork specimens known as var. *rustica* in that they were of a greyer tone of colour and the veins indicated in dark grey; he suggested ab. *venosa* as a suitable name to distinguish the form.—Mr. Staniland, large galls on the roots and branches of crab-apple from N. London formed by the woolly aphis, *Schizoneura lanigera*.—Mr. H. Leeds, the heart of a cauliflower with extensive fasciation and of a green coloration.—Mr. B. Adkin, specimens of *Brenthis selene* and *B. euphrosyne*, and inquired what were the upperside differences if any.—Mr. H. Moore, a short series of *Teracolus puniceus* = *hetera* from Nairobi.—Mr. K. G. Blair, a *Papilio machaon* without the red spot at the anal angle of the hind wing, and a very light form of *Crambus pascuellus* from Tring.—Mr. Blenkarn, the local Coleoptera, *Pentarthrum huttoni*, from Killarney, and *Lissodema cursor* from Rannmore Common.—Mr. Dennis, the oak "spangle" gall, *Neuroterus numismatis*, from N. Sussex.—Mr. Bunnett, the var. *doubledayaria* of *Amphidasys betularia* with an intermediate form from S.E. London.—Mr. R. Adkin read a report as the Society's Delegate to the Conference of Corresponding Societies of the British Association.

January 12th, 1922.—Mr. E. J. Bunnett, M.A., Vice-President, in the Chair.—A Member exhibited *Heliopholus hispidus*, the dark form from Torquay, and the lighter form from Dorset, and a very dark aberration of *Ortholitha plumbaria*.—Mr. Withycombe, larvæ of *Tæniorhynchus richardi* (Dip.) attached by siphons to roots of *Typha angustifolia* from Epping, with illustrative photographs.—Mr. Hy. J. Turner, for Mr. Thomas Greer, Tyrone, the following aberrations recently taken by him: *Euchloë cardamines*, (1) ♂, ab. *marginata*; (2) ♂, dark streaks on the orange blotches; (3) ♂, very small; (4) ♂, unusually large; (5) ♀, ab. *radiata*; (6) ♀, with orange streaks above and below. *Melitæa aurinia*, ♀, dull obscure coloration. *Pararge megæra*, (1) ♂, with apical ocellus reduced to a small dot; (2) ♂, with double apical ocellus. *Polyommatus icarus*: (1) gynandromorph R. ♂, L. ♀; (2) ♂, with faint red marginal blotches upper side hind margin hind wings, underside ab. *icarinus*; (3) ♀, with marginal red blotches extended to form a band.—Mr. Goodman, *Cænonympha tiphon*, typical and rare *philoxenus* from Britain, and rare *isis* from the Dauphiné.—HY. J. TURNER, Hon. Editor of *Proceedings*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held on February 1st, 1922, at the Manchester Museum, Mr. H. Britten, F.E.S., in the Chair.—Messrs. G. E. Whitehead, Wychwood, Buxton; E. R. Brown, 237, Brunswick Street, Manchester; C. S. Merriman, 22, Central Road, West Didsbury, were elected members of the Society.—*Exhibits*: Mr. G. Wynne, series of *D. galii* from N. Cornwall, larvæ; *D. tiliæ*, including 1-spot and banded forms from Kent, larvæ; and *M. porcellus* from Macclesfield, larvæ; all bred this year.—Mr. W. P. Stocks bred *E. lanestris* and 2 Noctuæ, near *M. thalassina*.—Mr. Britten for Mr. Wright, series of the new Tineid *Blastobasis lignea* from Grange.—Mr. Britten, *Hylephila obtusa*, *H. sponsa* and *H. sp. ?*, species of Diptera which follow Hymenoptera in flight. Ova of Lepidoptera preserved by blowing and mounted on black cards. About 60 species of Diptera new to Lancashire and Cheshire list in addition to those exhibited last month.—Mr. R. Tait then read

a paper on "*Agrotis ashworthii*: Life-History up to date." In addition to the general history of the life of this interesting moth he gave some very interesting personal experiences of collecting and breeding the insect. Mr. Tait illustrated his paper by a drawer containing a fine series of the perfect insect showing marked variation. His remarks and experiences were confirmed and amplified by Messrs. W. Buckley and C. F. Johnson, who both exhibited a fine series of the perfect insect.—J. F. G. WYNNE, *Hon. Recording Secretary*.

OBITUARY.

W. L. DISTANT.

It is with sincere regret that we record the death, on February 4th, of another old and valued contributor to our pages, who had also been a member of our Reference Committee since February, 1890. After a long illness, due to cancer, the end came, at a nursing home at Wanstead, at the age of seventy-seven years.

Born at Rotherhithe on November 12th, 1845, William Lucas Distant was a son of Capt. Alexander Distant, "who, in old South-Sea whaling-days, sailed round and round the world, and transmitted a love of roaming to his sons." On August 5th, 1867 (which he always spoke of as being the most eventful day of his life), our friend himself started on a voyage to the Malay Peninsula, a voyage which bore fruit in 1882-1886 in the publication of his valuable work '*Rhopalocera Malayana: a Description of the Butterflies of the Malay Peninsula*.'

In 1873 he married Edith Blanche de Rubien, and his family consisted of five sons and three daughters.

In June, 1890, he sailed for a "twelve months' business sojourn in the Transvaal," in connection with the tanning industry, and an account of his observations and experiences as a student of Nature was published in 1892, under the title of '*A Naturalist in the Transvaal*.'

In 1897 he succeeded J. E. Harting as Editor of '*The Zoologist*,' and resigned the editorship at the end of 1914.

Another visit to the Transvaal was made in 1898, and during 1900-1911 appeared the first volume (which had no successor) of '*Insecta Transvaaliensia: A Contribution to a Knowledge of the Entomology of South Africa*.'

From April, 1899, to November, 1920, he was engaged as a part-time Assistant at the British Museum (Natural History), and during this period of 21½ years he re-arranged the national collection of Rhynchota, and described in a voluminous series of memoirs the wealth of new species which he found there. His private collection of about 50,000 specimens, chiefly Rhynchota, and containing altogether over 2,500 types, came to the Museum in 1911, and the purchase of it by the Trustees was completed nine years later. The large and attractive insects forming the Cicadidæ always remained his favourite group.

A series of family bereavements contributed largely to the break-up of his health. In 1913 his second son was drowned in Australia, his wife died in 1914, and in the following year his youngest son died at Alexandria, while serving with the Mediterranean Expeditionary

Force. Towards the end of 1920 he went for a prolonged visit to Yarmouth, which was always a favourite health-resort of his, but, as his colleagues had only too clearly foreseen, he was destined never to resume his labours in the old fields of activity. He was buried in the family grave at Nunhead Cemetery on February 7th, 1922.

His connection with the Entomological Society of London was a long one, for he was elected a Fellow (then termed a Member) as long ago as 1875. He was a Vice-President in 1881 and again in 1900, and acted as one of the Secretaries from 1878 to 1880, while he served upon the Council from 1900 to 1902. Of other learned societies he was Member of the Anthropological Institute (of which he was Director and Honorary Secretary 1878-1881), Member of the Entomological Society of France, and Corresponding Member of the Entomological Society of Stockholm and of the Buffalo Society of Natural Sciences.

Distant's literary output was considerable, and reference has already been made to his special memoirs and the books on the Transvaal and the Malay Peninsula. Other important publications were: 'Biologia Centrali-Americana,' 'Hemiptera-Heteroptera,' vol. i (1880-1893) and (in part) 'Hemiptera-Homoptera,' vol. i (1881-1905); 'A Monograph of Oriental Cicadidæ' (1889-1892); 'The Fauna of British India,' 'Rhynchota,' vols. i to vii (1902-1918); and 'A Synonymic Catalogue of Homoptera, Part I—Cicadidæ' (1906).

Although he was keenly sensitive to adverse criticism, his conversation was both humorous and entertaining, as he always had a large fund of anecdote and reminiscence to draw upon, and knew how to tell a good story with the greatest effect. At one time he was an enthusiastic fresh-water fisherman, but, when the burden of years began to press heavily upon him, he found a more congenial pursuit in the cultivation of his flower-garden. Angling and gardening incidents never failed as a basis for friendly intercourse, whenever he met with others who shared in his genuine love for such things.

HERBERT CAMPION.

WILLIAM PURDEY.

As announced in the February number of this magazine, the death of William Purdey took place on January 19th last.

He was born at Folkestone on January 22nd, 1844, and was thus within three days of the completion of the seventy-eighth year of his age on the date of his decease.

By occupation he was a locksmith, and for fifty-six years he faithfully served the South-Eastern Railway Company, his particular duty being to keep in repair the locks on the Channel boats.

Purdey was essentially a field lepidopterist, and his special study, at any rate for many years past, has been the lesser British Lepidoptera, including all groups except the *Tineina*.

He was of an exceptionally persevering and energetic nature, with excellent powers of observation, and the necessary sound judgment to enable him to use these qualities to the best advantage. He was unquestionably, if not *the* best, at any rate one of the very best field workers we have ever produced.

His contributions to the literature of the science were comparatively few, and mostly consisted of records of his captures. The

earliest the writer can trace is an announcement that he had bred *Eudemis euphorbiana*; this note appeared in the 'E.M.M.,' vol. v, p. 106 (1868).

He was the discoverer of *Rhyacionia purdeyi*, a Tortrix new to science, which the describer, Mr. J. H. Durrant, named after him, 'E.M.M.,' vol. xlvii, p. 252. He also reinstated *Hellensia carphodactyla* in the British list, 'Ent. Record,' vol. xix, p. 78.

His last note appears to have been on the discovery of the larva of the very local plume, *Oxyptilus pilosellae*, for which he had discovered a locality near Folkestone, 'Entomologist,' vol. xliii, p. 89 (1910). He also described the larva of *Lozopera beatricella*, 'Entomologist,' vol. xxxii, p. 306.

Amongst the most notable of his captures were a specimen of *Aplasta ononaria*, one of about half-a-dozen that have ever been found in Britain, and one of *Diasemia ramburialis*, of which species Barrett states "seven examples have occurred in Britain"; he also records the capture by himself of *Argynnis lathonia* and *Euvanessa antiopa* at Folkestone.

Purdey was famous for his captures of the rare and beautiful forms of *Peronea cristana* occurring at Folkestone, including those of ab. *purdeyana*, named after him by S. Webb. Of this form every specimen known (about a dozen in number), except one, was taken by Purdey.

Of the extremely rare and beautiful ab. *tolana*, Desvignes, he took five examples, and also perhaps the most beautiful specimen in existence, the one Clark took for his type of ab. *charlottana*, which is, however, identical with the form named previously by Desvignes ab. *curtisana*. The most abundant white form, ab. *subcapucina*, Desvgs., extremely rare elsewhere than at Folkestone, he captured in scores; the writer possesses thirty of these, and has seen a considerable number in other collections.

Purdey possessed his powers unimpaired almost to the last, and made many captures during the past summer; two years ago he indulged in a day's collecting involving a walk of at least twenty-five miles!

He had an excellent collection of the groups he studied, and the writer well remembers with what surprise he looked through it a few years ago, and saw the long rows of rare species, all of his own capturing. There were very few occurring in the south-east of England that he could not obtain as many examples as he required, when necessary!

During his long life he became associated more or less intimately with practically every lepidopterist who was his contemporary, including Howard Vaughan, P. B. Mason, J. A. Clark, C. A. Briggs, W. P. Weston, Sydney Webb, Battershell Gill, and very many others.

Purdey was something more than a very capable field lepidopterist. In all his actions he was honest, straightforward and honourable; a man whose word was to be trusted, and who thought and spoke of his fellow men with kindness and courtesy.


He had earned the respect and esteem of all who came into contact with him.

W. G. S.

February 15th, 1922,

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

 NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—*Athalia*, *Polychloros*, *Paniscus*, and many others. *Desiderata.*—Fine female *Davus* and a few others.—*B. W. Adkin*, 8, *Hope Park, Bromley, Kent.*

Duplicates.—*Cerago*, *Silago*, *Plecta*, *Segetum*, *Xanthographa*, *Pallens*, *N. c-nigrum*, *Solidaginis*, *Decolorata*, and *Doubledayaria*. *Desiderata.*—*Porata*, *Trilinearia*, *Pendularia*, *Heparata*, *Atomaria*, *Piniaria*, *Juniperata*, *Comitata*, *Bipunctata*.—*H. W. Baker*, 26, *Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.*

Duplicates.—*Gemmaria* (dark), *Obscurata*, *Obfuscata*, *Auroraria* (pink var.), *Rubricata*, *Pendularia*, *Sylvata*, *Cambrica*, *Alternata*, *Belgiaria*, *Cæsiata*, *Dealbata*, *Unifasciata*, *Centaureata*,* *Absinthiata*,* *Innotata*,* *Lariciata* and var., *Pusillata*, *Sobrinata*, *Imbutata*, and *Atrata*. *Desiderata.*—"Waves" and "Pugs" or offers.—*W. G. Clutton*, 136, *Coal Clough Lane, Burnley, Lancs.*

Duplicates from well-known collection, many in fine condition: *Aurinia*, *W-album*, *Betula*, *Chaonia*, *Trimacula*, *Curtula*, *Pigra*, *Anachoreta*, *Muralis*, *Coryli*, *Orion*, *Leporina*, *Rubricollis*, *Quadra*, *Lurideola*, *Alni*, *Leucophæa*, *Rumicis*, *Phragmitidis*, *Absinthii*, *Chomomillæ*, *Tripartita*, *Festucæ*, *Pulchrina*, *Moneta*, and others. *Desiderata.*—Pupæ and imago in fine condition only with full data.—*W. S. Gilles*, *The Cottage, Bocking, Braintree, Essex.*

Duplicates.—*Io*,* *Galatea*, *Caniola*, *Exulans*, *Rumicis*, *Suffusa*, *Pyramidea*, *Vetusta*, *Ambigua*, *Comes*,* *Nigra*, *Oxyacanthæ*, *Impura*, *Carpophaga*,* *Capsincola*,* *Moneta*, *Lunosa*, *Ligula*, *Fluviata*,* *Siterata*, *Truncata*, *Asinalis*, *H. sinuella*. *Desiderata.*—Well set renewals, local forms, or pupæ.—*P. P. Milman*, *Cyprina, Lower Conway Road, Paignton.*

Duplicates.—*Ova*: *P. populi*, *Antiqua*, *Silago*. *Imagines*: *T. rubi*, *Silago*,* *Antiqua*,* *Hyperanthus*, *Napi* (vernal), *Adustata*, *Populata*, *Baja*, *Atomaria*, *Boreata*, *Multistrigaria*, etc. *Wanted.*—Very numerous in all stages.—*Thomas Smith*, *Whiston Eaves, Froghall, Stoke-on-Trent.*

Duplicates.—*Napi* (Irish), *Rhamni*, *Selene*, *Aurinia*, *Atalanta*, *Sibylla* (fine), *Galatea*, *T. rubi*, *Ægon*, *Corydon*, *Hectus*, *Crepuscularia*, *E. autumnaria*, *Advenaria*, *Multistrigaria*, *Lariciata*, *Tristata*, *Viretata* (fine), *Populata*, *Straminea*, *Canne* (few), *Fimbria*, *Ægur*, *Cerago*, etc., etc. *Desiderata.*—*Fluctuosa*, *Depuncta*, *Venustula*, and very numerous to replace first rate condition only.—*W. C. Wells*, 354, *Boldmere Road, Erdington, Birmingham.*

Duplicates.—*Sibylla*, *Galatea*, *Ocellatus*, *Tipuliformis*, *Rhizolitha*, *Socia* (2), *Semibrunnea* (1 fair), *Prunaria* (4 ♂s), *Roboraria* (fair ♂s), *Hastata*. *Desiderata.*—*Castrensis* ♂s, *Cucullina*, *Cribrum*, *Cinerea*, *Ravida*, *Ashworthii*, *Notata*, *Obfuscata*, *Smaragdaria* and others, also vars. and local forms.—*Harold E. Winsor*, *Kent House, Cranleigh.*

Specially Wanted for Research Purposes.—Fertile ova of all species of *Ennomos* except *E. autumnaria*. *Duplicates.*—*Ova*: *Autumnaria*, *Antiqua*. *Pupæ*: *Trepida*, *Bidentata* (black). *Imagines*: *Io*,* *Fuliginosa*,* *S. populi*,* *Carpini*, *Caja*,* *Villica*,* *Autumnaria*,* *Quercinaria*,* and others.—*G. Wynne*, 78, *Shrewsbury Street, Old Trafford, Manchester.*

TO CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-BURY, N.W. 2.

CONTENTS.

The Fossil Sawflies of Florissant, Colorado, *T. D. A. Cockerell*, 49. The Genus "*Amblypodia auctorum*" (De Niceville, Moore, Swinhoe, etc.), nec Horsfield (Lep. Rhop.), *N. D. Riley, F.E.S., F.Z.S. (continued from p. 29)*, 51. Notes on the Lepidoptera of the Assynt District of Sutherlandshire, *W. G. Sheldon, F.Z.S., F.E.S. (continued from p. 35)*, 53. Notes on British Neuroptera in 1921, *W. J. Lucas, B.A., F.E.S.*, 57. A Synopsis of British Proctotrypidæ (Oxyura), *Claude Morley, F.E.S., F.Z.S., etc. (continued from p. 3)*, 59.

NOTES AND OBSERVATIONS.—The Order Neuroptera, *G. V. Hudson*, 61. *Leucania vitellina* reared from Ova, *H. McD. Edelsten*, 62. Early and Late Dates for Lepidoptera, *E. D. Morgan*, 62. Additions to Glamorgan List of Lepidoptera, *F. Norton*, 63. Collecting by Powerful Lights, etc., (*Dr.*) *Richard C. Lowther*, 63. *Emmelesia minorata*, etc., at Grassington, *W. G. Clutton*, 64. Non-Attractiveness of Electric Light: A Query, (*Rev.*) *J. E. Tarbat*, 64. *Leptogramma literana* in Yorkshire, *T. Ashton Lofthouse, F.E.S.*, 65. Butterflies of the Vienna District, *B. H. Cooke (Lieut.-Col.)*, 65. Nymphs or Naiads, *T. D. A. Cockerell*, 67. *Platymischus dilatatus*, Westwood, *T. D. A. Cockerell*, 67. *Libellula depressa*, Linn. (Odonata), *A. W. Richards*, 67. Hemerobius stigma, Steph. (Neuroptera), *W. J. Lucas*, 67. Resting Habit of *Pieris rapæ*, *A. H. Thompson*, 67.

SOCIETIES.—The Entomological Society of London, 68. The South London Entomological Society, 68. Manchester Entomological Society, 69.

OBITUARY, 70.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*March 1st and 15th.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, March 9th, at 7 p.m.*, Paper, "Orchid Seeds and their Fertilization." *Thursday, March 23rd, at 7 p.m.*, Paper, "The Arachnida of Surrey."—*Hon. Sec.*, STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec.*, W. E. GLEGE, The House, Albion Brewery, Whitechapel Road, E. 1.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.

Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

Vol. LV.]

APRIL, 1922.

[No. 707.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

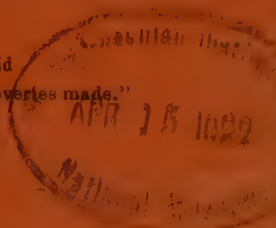
N. D. RILEY, F.E.S., F.Z.S.

Dr. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."



LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

WANTED AT ONCE.—Hundreds of *Lycæna belargus* ♂; *Corydon* ♂; *Euchloe cardamines* ♂, and *Vanessa io* ♂ or ♀. Also a few *Thecla rubi* and *Lyc. arion*. Will give cash or exchange. Can offer Californian or Tropical Butterflies. Dealers or collectors of butterflies in India, Java, Oceania, etc., please send list of showy butterflies.

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of **BRITISH LEPIDOPTERA**. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

THE ENTOMOLOGIST.

Vol. LV.]

APRIL, 1922.

[No. 707

EDITORIAL.

For a period of over thirty years it has been my much valued privilege to conduct this Journal. Under advice, however, I have now reluctantly decided to withdraw from some of the duties this work entails. To this end Captain Norman D. Riley has very kindly undertaken to act as Editor for me from May next. [R. S.]

NOTES ON THE LEPIDOPTERA OF THE ASSYNT DISTRICT OF SUTHERLANDSHIRE.

By W. G. SHELDON, F.Z.S., F.E.S.

(Concluded from p. 57.)

Eulype hastata.—I only saw one example; this was at Lochinver and in the possession of Mr. Whittle. It was the form *subhastata*, Nole, or near it.

Mesoleuca ocellata.—Common.

Perizoma alchemillata.—One example at Inchnadamph.

P. albulata.—Common in meadows.

P. minorata.—Not uncommon on rocks at Lochinver.

P. blandiata.—Abundant; the form is in some instances distinctly more banded than Rannoch specimens.

Camptogramma bilineata.—Abundant; most of the specimens are much darkened; some of them are similar to *ab. hibernica*, Prout, as figured in South's 'Moths of the British Isles.' pl. 61, fig. 5, and some are even darker than that specimen.

Hydriomena furcata.—The larvæ of this species were common at Lochinver on the sallows. I beat out some three dozen, from which I only bred six examples, but these made me wish I had a much longer series. No two of the specimens are alike and they are all good aberrations. One is *ab. infuscata*, Staud.; two are forms near *fusco-undata*, Donovan. The most remarkable example has white ground-colour to the superiors, clouded and mottled with bright chestnut colour, and some black transverse markings.

H. impluviata.—Lochinver, amongst alder; the only example brought home is a light-coloured variegated form.

H. ruberata.—Some half-dozen larvæ turned up amongst willow tips gathered to rear *Peronea hastiana* from.

Eupithecia pulchellata. Larvæ common on foxgloves at Lochinver. The series bred includes the southern type, race *hebodium*, Sheldon, and intermediates.

E. lariciata and *E. castigata*.—A few examples of each at Lochinver.

E. satyrata,* var. *callunaria*.—Common flying over heather.

E. plumbeolata.—I met with this species fairly commonly at Inchnadamph under remarkable circumstances; it is, of course, well known that the usual, and, so far as my knowledge goes, the only recognised food-plant, is *Melampyrum pratense*; but the moth at Inchnadamph was only found in meadows where *Melampyrum* does not grow. They, too, seemed to have the transverse lines somewhat more pronounced than in southern examples of this species, and one wondered if possibly a hitherto unrecognised British species had been met with in this remote spot. Females were captured and confined over specimens of all the likely plants growing in the meadows, with the result that they deposited eggs on *Rhinanthus crista-galli* and *Euphrasia officinalis*; on the seeds and flowers of these plants, and also on those of the nearly allied *Bartsia odontites*, the larvæ fed up. These larvæ showed a remarkable feature which is not noticeable in the specimens fed upon *Melampyrum pratense*—they had very noticeable black chitinous thoracic and anal plates! I consulted Mr. Prout, who thought they might refer to the nearly allied *E. immundata*, which has these plates, and is found in North-West Europe. The imagines, however, when compared with specimens of *E. immundata* in the National Collection, did not agree with that species, and with the exception that the wings were slightly narrower in relation to their length, did not appear to differ from *E. plumbeolata*. Examples were then handed to Mr. Pierce for examination of the genitalia, but these were found to be indistinguishable from those of *E. plumbeolata*.

This discovery of additional food-plants has thrown light upon a problem that has puzzled me. Some years ago I netted in the centre of Wicken Fen examples of a moth which I could not distinguish from *E. plumbeolata*; and certainly *Melampyrum pratense* does not grow there. Last autumn, however, I did see *Rhinanthus crista-galli* growing freely in the Fen, and have no doubt but that it is the food-plant there also.

E. nanata.*—Common.

E. pumilata.*—Certainly the most abundant *Eupithecia*, being extremely common on the heathery ground. Some of the examples from Inchnadamph were entirely grey in colour.

Abraxas grossulariata.—A few at Lochinver, but abundant on the Island of Soyea.

Cabera pusaria.*—Fairly common.

C. exanthemata.—Lochinver, not common.

Ellopija prosapiaria.—Lochinver.

Metrocampa margaritata. *—Common.

Selenia bilunaria.—Lochinver; larvæ; Mr. Whittle.

Gonodontis bidentata.—Lochinver.

Opisthograptis luteolata.—Lochinver.

Epione apiciaria.—Lochinver; bred from sawfly.

Semiothisa liturata.—Lochinver.

Hybernina marginaria and *Phigalia pedaria*.—Larvæ at Lochinver on birch and sawfly.

Pachys betularia.—Lochinver; at rest on rocks; the light form only.

Boarmia repandata. *—Common at rest on rocks; the specimens were grey, resembling the Hebridean form *ab. sodorensium*, Weir.

Gnophos myrtillata. *—Not uncommon at rest on rocks; a rather dark form.

Ematurga atomaria. *—Common on the moors.

Bupalis piniaria.—Lochinver, abundant; the northern form of course.

Thamnonoma wauaria.—Gardens at Lochinver.

Scodionia fagaria.—Lochinver, rare.

Zygaena filipendulæ.—I could not come across a colony of this species on the mainland, but Mr. Adkin reports that William Salvage found one on the mountain, Suilven, and Mr. Whittle wrote me that he found a Zygænid cocoon at Lochinver which was probably one of this species. As I have already stated, there was a numerous colony on the Island of Soyea. The examples of those I have brought home do not differ from southern specimens with the exception that the thorax and abdomen is somewhat more shaggy.

Hepialus humuli.—Lochinver; the examples are strictly typical.

H. sylvinus.—Reported by Mr. Whittle from Lochinver.

H. fusconebulosa (velleda). *—Common at Lochinver, less so at Inchnadamph. A very dark and richly variegated form, quite as much so as the Shetland specimens; var. *gallicus*, Ld., occurred in the proportion of about 1 to 5 of the type form.

Scoparia ambigua *alis*, race *atomalis*. *—Abundant everywhere.

S. murana.—One or two examples on walls at Inchnadamph.

S. frequentella.—Lochinver, at rest on rocks; common.

S. angustea.—Reported by Mr. Whittle at rest on the house at which we stayed at Lochinver.

Nemeophila noctuella.—Very pale specimens were common on Soyea at the end of June.

Pyrausta purpuralis. *—A few examples only of either this species or of *P. ostrinalis*; the specimens are intermediate.

Botys lutealis.—Lochinver; reported by Mr. Whittle.

B. fuscalis. *—Common.

B. forficalis.—In gardens at Lochinver.

Chrysocoris festaliella.—One or two examples at Lochinver.

Stenoptila bipunctidactyla.—Inchnadamph; abundant in a meadow.

Amblyptilia punctidactyla.—Lochinver.

Crambus prætellus.*—Abundant.

C. ericellus.*—Frequent in its usual haunts, *i. e.* moors on which heather is mixed with grass, and at an altitude of about 500 ft.

C. pascuellus.*—Extremely local but not uncommon.

C. culmellus.*—Abundant.

C. margaritellus.*—Extremely local but not uncommon.

Salebria fusca.*—Not common; a very variegated form, similar in this respect to *S. betulæ*.

Galleria sociella.—Lochinver.

Tortrix rosana and *T. ribeana*.—Lochinver, bred.

T. viburniana.*—Common amongst *Myrica gale*.

Peronea rufana.*—Larvæ on *Myrica gale*, mostly the pale straw coloured unicolorous form; one or two examples have traces of longitudinal streaks.

P. mixtana.—The larvæ of this species were extremely abundant at Lochinver, each tuft of *Calluna vulgaris* on the moors having several larvæ in it. The imagines bred varied from unicolorous reddish brown to almost white = *ab. provinciana*, Peyer.

P. hastiana.—This species was as abundant on willow at Lochinver and on the Island of Soyea as the last was on heather. It was noticeable that only the very small bushes that did not rise above the surrounding heather were frequented. On bushes that attained a greater height than this hardly a larva was to be found. I brought home two large bagsfull from Lochinver and bred out over 1000 examples. Many of them are very remarkable; one or two very beautiful forms I have never seen before. They are developments of *ab. byringerana*, Hüb., having the brown transverse strigæ broken up with white blotches and longitudinal striæ, and somewhat closely resemble *P. cristana*, *ab. capucina*, Johnson. The other forms include *abs. mayrana*, Hüb., *autumnana*, Hüb., *combustana*, Hüb., *aquilana*, Hüb., *subcristana*, Stphs., *byringerana*, Hüb., *divisana*, Hüb., *albistriana*, Haw., *pruinosa*, Stgr., and numerous unnamed forms.

P. ferrugana.—Lochinver, bred from birch.

P. aspersana.—Soyea, bred from willow tips.

Rhacodia caudana.—Lochinver; reported by Mr. Whittle.

Penthina soroculana.—Lochinver, common amongst birch.

P. dimidiata.*—Abundant amongst *Myrica gale*, both in larva and imago stages.

P. marginana.*—A few examples.

P. tripunctana.—Lochinver.

Sericoris littoralis.—A very bright silvery form with strong

fuscous transverse strigæ was common on the rocks on Soyea; we could not find it on the mainland, although thrift was a common plant along the seashore.

S. cespitana.—A fine bright ochreous form of this species was abundant on Soyea, and so far as our observations went it was peculiar to it, for we could not find it on the mainland.

S. lacunana.—A very small form.

Mixodia schulziana.—Occurring sparingly at all levels that I visited, *i. e.* up to 2000 ft.

Euchromia arbutella.—Not uncommon amongst its food-plant *Arctostaphylos uva ursi*.—At Lochinver.

Orthotaenia ericetana.—Common at dusk flying in meadows.

Cnephasia musculana.—Common, extremely bright forms.

C. penziana.—This much-wanted and beautiful species produced a mild sensation. On July 16th Mr. Whittle reported that he had disturbed on a rock, but missed, a very handsome moth, which from the momentary glance he had of it appeared to be a "Nola," but if it was a species of that group then it was new to Britain! The next day I, too, disturbed a moth from a rock, fortunately capturing it. Obviously it was *C. penziana*, and on showing it to my friend he at once pronounced it to be his lost prize. On the same evening I took another example, also from a rock, but although we both searched rocks and walls for hours each day for over a week, until after my departure further examples were not met with. Mr. Whittle, however, after that date discovered one on the garden wall of the house in which we stayed.

Bactra lanceolana.—Very abundant in all swamps up to 1500 ft.; the high-level forms were extremely small.

Ancylis unguicella.—A few examples only.

A. biarcuana.—Not uncommon amongst sallow.

A. myrtillana.—One example at Inchnadamph.

A. lundana.—Lochinver; not common.

Grapholitha ramella.—Reported by Mr. Whittle from Lochinver.

G. subocellana.—Abundant.

G. penkleriana.—Reported by Mr. Whittle from Lochinver.

G. tetraquetra.—Abundant.

Steganoptycha augustana.—Extremely brightly marked specimens were bred commonly in July from larvæ obtained in sallow shoots from Soyea; one or two examples were taken on the mainland.

Paedisca semifusca.—Larvæ common on *Myrica gale* in July; the examples bred were grey and brown forms only.

P. solandriana.—Reported by Mr. Whittle from Lochinver.

Halonota similana.—Lochinver, bred from birch.

H. pflugiana.—Lochinver, fine large examples.

H. trigeminana.—Lochinver.

Semasia rufillana.—Lochinver.

Coccyx nemorivaga.—Not uncommon amongst *Arctostaphylos* at Lochinver.

C. taedella.—Swarming amongst spruce at Lochinver.

C. distinctana.—This, one of our most local Tortrices, is apparently an introduced species to Britain, as it feeds exclusively on silver fir, *Pinus picea*, and on other non-indigenous conifers. It was therefore very surprising to find it at such an out-of-the-way spot as Lochinver. On the left bank of the river Inver, some quarter of a mile from its mouth, a dozen or more silver spruce trees had been planted forty or fifty years ago, and around these the species was fairly common at the end of June. The moths were knocked out of the lower branches, and were not seen to fly naturally.

Retinia pinivorana.—Lochinver, common amongst Scotch fir.

Stigmonota compositella.—Inchnadamph, in meadows.

Dicrorampha herbosana.—Lochinver, not uncommon in meadows.

Catoptria cana, and *C. scopoliana*.*—Common.

Eupoecilia angustana.*—Common; fine large dark specimens.

E. ciliella.—Lochinver.

Argyrolepis baumanniana.—Lochinver, very local; a small bright form.

A. straminea.*—Common in meadows.

A. pratana.—Lochinver.

A. hamana.—Lochinver.

I am indebted for the following list to Mr. Whittle, all taken at Lochinver by him.

LIST OF THE TINEINA, IN THE ORDER IN WHICH THE VARIOUS SPECIES OCCURRED, NOTED DURING OUR STAY AT LOCHINVER, JUNE 18TH TO AUGUST 27TH, 1921.

<i>Simaethis fabriciana</i> (common).	<i>Gelechia ericetella</i> .
<i>Lampronia praelatella</i> (common).	<i>Plutella maculipennis</i> .
<i>Lithocolletis ulmifoliella</i> .	<i>Elachista rhynchosporella</i> .
<i>Argyresthia conjugella</i> (common).	<i>Gracilaria syringella</i> .
<i>Coleophora albicosta</i> (common).	<i>Endrosis lacteella</i> .
<i>Scardia cloacella</i> .	<i>Gelechia terrella</i> .
<i>Elachista apicipunctella</i> .	<i>Coleophora laripennella</i> .
<i>Swammerdamia heroldella</i> .	<i>Aristotelia tenebrella</i> .
<i>Ornix betulæ</i> .	<i>Opostega salaciella</i> .
<i>Gracilaria tringipennella</i> .	<i>Argyresthia pygmaeella</i> .
<i>Glyphipteryx thrasonella</i> and var.	<i>Diplodoma herminata</i> .
<i>cladiella</i> .	<i>Argyresthia goedartella</i> .
<i>Argyresthia brockeella</i> .	<i>Tineola biselliella</i> .
<i>Pleurota bicostella</i> .	<i>Depressaria liturella</i> .
<i>Gracilaria elongella</i> .	<i>D. applana</i> .
<i>Coleophora claspititiella</i> .	<i>Chelaria huebnerella</i> .
<i>Phylloporia bistrigella</i> .	<i>Tinea pellionella</i> .
<i>Elachista kilmunella</i> .	<i>Gracilaria stigmatella</i> .

DIAPHORA MENDICA, FORM *VENOSA*, N.F.

BY ROBERT ADKIN, F.E.S.

Male, white-grey with a faint brownish tinge, veins darker grey, fringes paler. Female white-grey, veins darker grey, fringes white.

The form above described somewhat approaches *rustica*, and, as in that form, individuals vary somewhat in depth of colour, but differ from *rustica* in the general tone of colour inclining towards grey instead of ochreous shades. In the lightest males it is very pale grey with the slightest tendency towards a brownish tinge, while in the darkest the grey takes a somewhat more brownish tone, whereas in *rustica* there is always a suspicion of an ochreous tone even in the palest specimens, the darkest being a decided, although it may be pale, ochreous



♂

♀

brown. Moreover, the dark grey veining, especially in the more strongly marked specimens of both sexes, is a character that at once separates *venosa* from other forms of the species. This form is also less densely scaled than *rustica*, which gives it a semi-transparent appearance which is more particularly noticeable in the female. Both sexes have the black spotting common to the species more or less well-defined and agreeing as to the number of spots.

The race occurs in the lowlands of County Tyrone, Ireland, and a few specimens, reared from a captured female, bred true to form.

Types, male and female, in the collection of the British Museum (Natural History), and co-types in that of the Tring Museum and my own.

Eastbourne ;

February, 1922.

FURTHER NOTES ON THE ODONATA OF CONSTANTINOPLE AND ADJACENT PARTS OF ASIA MINOR.

BY KENNETH J. MORTON, F.E.S.

SINCE the appearance of my "Notes on the Odonata of Constantinople" ('Entomologist,' 1915, pp. 129-134), Major Graves has kindly sent me two additional lots of dragon-flies collected by him in and around Constantinople, and at Kury Yalova and Brusa, in Asia Minor. These include some species which are not mentioned in my former list, and as the existing information regarding the dragon-flies of the region is none too full, it may be well to publish these further records. Another reason for doing so is to call attention to the examples of *Lestes viridis*, which in some respects differ from the ordinary form of this species as it is known to me from Central and South-Western Europe and Algeria. The following species were not included in the collections previously received from Major Graves: *Lestes virens*, *Cercion lindeni*, *Pyrrhosoma nymphula*, *Aeschna mixta*, *Somatochlora flavomaculata*, *Sympetrum fonscolombi*, *S. meridionale* and *Orthetrum anceps*.

CALOPTERYGIDÆ.

Calopteryx virgo festiva, Brullé.—Belgrade Forest, ♀, i. vi. 19.

AGRIONIDÆ—LESTINÆ.

Lestes viridis, Vanderl.—Gyök-su, ♂, 6. viii; ♀, 13. viii. 20; Brusa, 2 ♂♂, 1 ♀, 19-21. ix. 20; Kestel, 10 m. S.E. of Brusa, ♂, 20. ix. 20.

Somewhat smaller and less robust than specimens in my collection from Switzerland, South of France, Sicily and Algeria, and there seems to be a constant and quite noticeable difference in the form of the superior appendages in their dorsal aspect. To follow the diagnosis of de Selys ('Revue des Odonates,' p. 148), these appendages in *Lestes viridis* show interiorly a basal tooth and what he terms a "tubercle" before the extremity (the expansion seems, however, to be too gradual for this term to be strictly appropriate). In his more extended description he says the inner margin is, as it were, divided into three lobes, of which the first is terminated near the base by an obtuse tooth, and the second by a tubercle before the extremity. In the eastern examples now under consideration this tripartite division is little evident, the distal tubercle being apparently represented by a weak tooth which scarcely projects beyond the inner margin of the appendage. There is a certain amount of individual variation in the appendages of both forms, probably in part due to unequal

shrinkage in drying, but in the main the distinction pointed out holds good. On the distal side of the tubercle in the larger form there are some short spines, variable in number, which I do not trace in the eastern examples. Post-nodals in the latter: Fore-wing, ♂ 9-11, ♀ 10; hind wing, ♂ 8-11, ♀ 9-11 (Selys gives 11-13 for *L. viridis*). Length of hind wing: ♂ 22-24 mm., ♀ 23-25.5 mm. (*L. viridis* from Zürich, ♂ 25-26 mm., ♀ 27-28 mm.).

Mr. Herbert Champion has been good enough to examine the material of *Lestes viridis* in the British Museum, and he reports that males from Belgium, Germany and Sicily agree with one another in having the distal tubercle well developed in the superior appendages, while in one from Cyprus it is barely, if at all, discernible, three males from Ostia, Italy, resembling the



Fig. 1.—Dorsal view of left superior appendage of *Lestes viridis*, ♂, from Brusa; fig. 2, of ♂ from Zurich.

last-mentioned. I had been disposed to consider Major Graves's specimens as an eastern race or sub-species, but the Ostia examples are a disturbing factor, and I leave the matter as it is until more abundant material is forthcoming, especially from Italy and the Balkan countries.

Lestes viridis is an interesting species on account of the circumstances connected with the hatching of the larvæ from the eggs, which are laid in the branches or twigs of willows and *Rhamnus* overhanging the water, and which give rise to what have been called "galls." Ris, in his "Übersicht der mitteleuropäischen *Lestes*-Larven" ('Festschrift für Zschöke,' Basel, 1920), gives characters for the determination of the larvæ of all the European species of *Lestinae* except *L. macrostigma*.

L. barbarus, Fabr.—Kuchük Chekmejé Lake, ♂, 31 . viii . 19.

L. virens, Charp.—Kury Yalova, ♂ ♀, 21-23 . viii . 19.

- Platynemis pennipes*, Pallas.—Gyök-su, 4 ♂ ♂, 1 ♀, 13 . viii . 20 ; Sweet Waters of Europe, ♀ (*lactea*), 14 . v . 20 .
Cercion lindeni, Selys.—Kuchük Chekmejé L., ♂, 29 . vii . 20 .
Pyrrhosoma nymphula, Sulz.—Kartal, ♀, 18 . iv . 20 .

ÆSCHNIDÆ—GOMPHINÆ.

- Onychogomphus forcipatus*, Linné.—Kiat-hané (European side), 2 ♀ ♀, 10–16 . viii . 19 ; Yalova, ♂, end viii . 19 .

ÆSCHNINÆ.

- Æschna mixta*, Latr.—Pera, ♀, 15 . viii . 19 ; Kuchük Chekmejé, ♀, 23 . vii . 20 .

LIBELLULIDÆ—CORDULINÆ.

- Somatochlora flavomaculata*, Vanderl.—Kadikeui (Asiatic side), ♀, 8 . vi . 20 ; Halki Island, Prince's Islands, 2 ♀ ♀, 10 . vi . 20 (“pine woods, common”).
S. metallica, Vanderl.—Belgrade Forest, ♂, 24 . vi . 19 .

LIBELLULINÆ.

- Orthetrum anceps*, Schneider.—Belgrade Forest, ♂, 20 . vii . 19 .
O. cancellatum, Linné.—Kuchük Chekmejé L., ♀, 29 . vii . 20 .
Sympetrum meridionale, Selys.—Kuchük Chekmejé, ♂, 31 . viii . 19 ; Yalova, ♀ end viii . 19 .
S. fonscolombei, Selys.—Kuchük Chekmejé L., ♂, 29 . vii . 20 .

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 60.)

1. PROCTOTRYPES BREVIMANUS, Kieff.

Serphus brevimanus, André, *l.c.*, p. 323, ♂ ♀.

Hitherto this species was only known in a single pair, captured at Govilon on the Usk, near Abergavenny, and at Niton, in the Isle of Wight, by the late Rev. T. A. Marshall. The female occurred to me at Killarney, in South-west Ireland, in June, 1913; and it occurred on the windows of Monks Soham House on September 1st, 1916, and July 10th, 1918. Sich has found it during October, 1907, on the stem of a mushroom at Kew, in Surrey.

2. PROCTOTRYPES LARICIS, Hal.

Proctotrupes laricis, Hal., *l.c.*, p. 14, ♂ ♀. *Serphus laricis*, André, *l.c.*, p. 322, ♂ ♀.

France. Not very common in English woods (Walker); once taken abundantly during September in Ireland (Haliday); two at Burgess Hill in Sussex on May 3rd, 1911 (Lyle); Scotland in September. (Cameron). Very rare in my experience. I have swept it from long grass near Coniferæ, at Bourne Bridge, in Ipswich, during May, and near Killarney, in Ireland, during early June. It once occurred among half a dozen *P. fuscipes* during May on lime leaves in my Monks Soham garden.

3. PROCTOTRYPES LONGITARSIS, Thoms.

Proctotrupes longitarsis, Thoms., Öfv. Sv. Ak. Forh., xiv, 1857, p. 415; Vollenhoven, Pinacographia, iv, p. 30, pl. xviii, fig. 8, ♀. *Serphus longitarsis*, André, l.c., p. 340, ♂ ♀.

Algeria, south coast of France, Lapland. Not hitherto recorded from Britain. I possess a female, correctly named by both Marshall and Chitty, which was captured by Alfred Beaumont on October 13th, 1894, at Boxhill, in Surrey. Chitty himself took one at Dodington, in Kent, on October 2nd, 1903, and I have found it singly at Tuddenham Fen in early June, and on Southwold beach during late and mid-September, in Suffolk.

4. PROCTOTRYPES ACULEATOR, Hal.

Proctotrupes aculeator, Hal., l.c., p. 14, ♂ ♀; Blanch. Cuvier, Regne Anim., 1849, pl. cxv, fig. 4; Voll., l.c., iv, 1876, p. 30, pl. xix, fig. 3, ♀. *Serphus aculeator*, André, l.c., p. 219, ♂ ♀.

France and Finmark. "A parasite of *Mycetophila nigra*," Mg. (Voll., who figures the female with entirely rosy and deeply notaulate mesothorax!). Not infrequent in woods (Haliday and Walker); Niton, in Isle of Wight (Marshall). Not very common with us. It doubtless hibernates, for my dates range from November 4th, 1897, when I swept it in a marsh at Bramford, in Suffolk, through mid-April, when it was beaten from *Pinus sylvestris* at Bentley, near Ipswich, to May 3rd and 4th, 1907, when Chitty and I found several on spruce fir at Elveden; Southwold, on salt-marsh rushes in mid-September, on the Suffolk coast; Felden, in Herts (Albert Piffard); Attenborough, Gedling, Mapperley Plains and Teversall, in Notts, during May (Notts Museum); Coventry on July 10th, 1920 (Saunt); several at Bubwith, near Selby, in Yorks (Dr. Fordham); Ballater on August 8th, 1910, in Scotland (Elliott).

(To be continued.)

NEUROPTERA IN DORSET.

By F. H. HAINES, M.R.C.S., L.R.C.P.

DURING the last few seasons the following species of Neuroptera have been met with by me in the Wareham district. The list is not rich, but it may have some interest: *Sialis lutaria*, Linn., abundant on all rivers and suitable ponds, chiefly in May, but also much earlier and later. I have never detected *S. fuliginosa*, Pict., here: Dale calls it abundant at Glanvilles Wootton. *Raphidia maculicollis*, Steph., at Morden, Moreton and Upper Bockhampton in June. Dale records *R. xanthostigma*, Schum., from Glanvilles Wootton, and *R. notata*, Fab., from Middlemarsh. [I may mention, incidentally, that several years ago, the rare *R. cognata*, Ramb., used to be quite common in a copse near the river Eden, at Hever, in Kent, frequenting brushwood in June. It was so active as to be difficult to catch without a net.] *Osmylus chrysops*, Linn., is very uncommon; *Sisyra fuscata*, Fab., common near East Stoke mill and Morden lake from May to July; *Hemerobius micans*, Oliv., East Stoke in July, Morden in September; *H. nitidulus*, Fab., Moreton in May; *H. humuli*, Linn., very common and wide-spread throughout the year; *H. lutescens*, Fab., Morden, Bloxworth and Coombe Wood in May and June; *H. marginatus*, Steph., at East Stoke in July; *H. subnebulosus*, Steph., at Winfrith in gardens, West Lulworth, etc., from May to September; *H. stigma*, Steph., East Lulworth, Morden, Moreton, etc., from May to September; *H. concinnus*, Steph., one specimen in West Knighton Wood, June 13th, 1919, *H. quadrifasciatus*, Reuter (?), one specimen at Bloxworth, June 11th, 1919. *Micromus paganus*, Linn., Coombe Wood, Wood Street, Winfrith gardens and Upper Bockhampton, May to July.

Dale has recorded from Glanvilles Wootton *S. dalii*, McLach., *H. nervosus*, Fab., *H. atrifrons*, McLach., *H. pini*, Steph., *H. pellucidus*, Walk., *Micromus variegatus*, Fab., and *M. angulatus*, Steph.

I have taken *Chrysopa vittata*, Wesm., in the Wood Street woods in June; *C. flava*, Scop., at East Chaldon in June; *C. alba*, Linn., at Coombe Wood, Upper Bockhampton, Yellowham Wood, and West Knighton Wood from June to August; *C. flavifrons*, Brauer, at Tadnoll and Moreton in July; *C. tenella*, Sch. (?), in the Wood Street Woods in June; *C. vulgaris*, Sch., is distributed very commonly in the area during the whole year; the condition, *carnea*, is very frequent throughout the winter, specimens often coming to light. *C. prasina*, Ramb., Morden, East Stoke and West Knighton woods in June and July; *C. ventralis*, Curt., Morden, Holme, Upper Bockhampton and Yellowham Wood in June and July; *C. abbreviata*, Curt.,

Bloxworth in June; *C. phyllochroma*, Wesm., Winfrith gardens in June; *C. perla*, Linn., is one of our most abundant species, occurring very freely in all bushy places through the summer, especially in May, June and July.

Dale has recorded from Glanvilles Wootton *Nothochrysa capitata*, Fab., *Coniopteryx psociformis*, Curt., and (?) *C. lactea*, Wesm.

Panorpa communis, Linn., is very common in all woodland places through the summer, notably from June to August; *P. germanica*, Linn., is extremely abundant in brushwood the whole summer, particularly from May to August; it is very variable.

Brookside,
Winfrith,
Dorset.

RUSSIAN ODONATA AND NEUROPTERA.

BY W. J. LUCAS, B.A., F.E.S.

JUST before the outbreak of war Mr. W. G. Sheldon was kind enough to give me a few insects, which he took at Sarepta on the Volga in South-eastern Russia during May and June 1914. Although that date, after all that has since happened, seems almost prehistoric, yet as the fauna of the district is not too well known, even thus late it will not be unsuitable to publish the list. As out of fourteen insects in the little collection there are no less than eleven different species, it may be inferred that Mr. Sheldon purposely selected the specimens he brought away. One or two are somewhat damaged, some are very teneral, and some again are represented by females alone. It is strange that only four species of the dragonflies (indicated by an asterisk) are not British—*Orthetrum albistylum*, *O. brunneum*, *Lestes barbara*, and *Sympycna fusca*. There are no British antlions.

Odonata.

Libellula quadrimaculata, Linn. 1 June. A large female, strongly marked especially at the nodes, and, in this respect, somewhat like many Southern England examples.

**Orthetrum albistylum*, Selys. 12 June. A female quite mature.

**Orthetrum brunneum*, Fonsc. 12 June. A teneral female.

Sympetrum flaveolum, Linn. 4 June. A very teneral female of good size, with wings rather broad and much suffused with a saffron tint.

**Lestes barbara*, Fabr. 26 May. Two teneral females.

**Sympycna fusca*, Vanderl. 26 May. A male.

Ischnura pumilio, Charp. 8 June. A male and a female taken in copula.

Agrion pulchellum, Vanderl. 27 May, a male; 21 May, a female.

Erythromma naias, Hansem. 5 June. A male.

Enallagma cyathigerum, Charp. 8 June. A male.

Neuroptera.

**Formicaleo tetragrammicus*, Fabr. An antlion taken on 30 May.

[Mr. A. H. Jones, who accompanied Mr. Sheldon, gave me another antlion, taken at Sarepta in June—**Myrmecaelurus trigrammus*, Pall.]

Kingston-on-Thames;
March, 1922.

NOTES AND OBSERVATIONS.

SOME LEPIDOPTEROUS NOTES FOR SOUTH DORSET OF UNUSUAL HABITS, ERRATIC DATES, AND OCCURRENCES FOR 1921.—My observations for 1921 have been similar to many others, since the summer was so exceedingly hot that one expected abnormalities in all directions; yet contrary to these expectations some of the unusual habits which I have to record would have synchronised better with a cold one. For instance, the laying-over habit of pupæ I found was very prevalent last summer, much more so than usual, although one would have expected the reverse, and I found that several species which are regularly double-brooded failed to do so, and are still in the pupa. As regards Rhopalocera, I have only two to report on—*Cyaniris argiolus* and *Chrysophanus phlaeas*. Of the first I had a large quantity from ova deposited by May females on holly; they had all pupated by June 25th, and 50 per cent. emerged between July 10th and 16th; the rest I expected to emerge in September, but I have them still and no doubt they will emerge as spring brood, after passing through the whole of the hot summer of 1921. I took several female *phlaeas* in September last, obtained ova to get pupæ for spring brood 1922, the larvæ emerged and I fed them upon sorrel; I noticed they didn't seem to feed as fast as some of the earlier broods I had reared, and when they got to November (hardly a quarter grown) it was manifest that they didn't intend pupating as they should do, but going to hibernate instead. I have eight still living (February 14th) in a cool outhouse and I feed them twice weekly, but I have had several die lately and am enclosing one that died two days ago as an authentic record. They will remain under a particular leaf for a week or nine days, then move out and eat small holes in the leaves for a day or so. As late as January 10th I found two larvæ of similar size to my own under some sorrel leaves I brought home to feed mine on. I think this seems to prove that it has the dual habit of sometimes passing the winter in the pupa, or if the ova are deposited by late females the young larvæ hibernate. I should be glad to know if anyone else has had this experience of *phlaeas*. Taking Heterocera

for the year 1921, I have a quantity of pupæ of the following laying-over that should have emerged as a second brood last summer (in the regular way) and some partially emerged, the rest going over, which seems more curious still, and in one instance (that of *Venilia maculata*) going through a second winter this time. *G. rhizolitha* all emerged August 10th to August 18th—very early date. *Xanthorhoë sociata*: 20 per cent. of summer brood emerged, the rest going to emerge next spring. *Mesoleuca ocellata*: I have forty fine larvæ which spun up in thin webs on the side of the pot last August; the larvæ have been in a half-circle inside ever since, half changed to pupæ, and the first three did so last week (February 8th, 1922). The others now look as though they are going to change also. *Xanthorhoë montanata*: Have been feeding sixty odd larvæ all last summer; only three pupated. One emerged October 10th, 1921, and was in pupa only fourteen days; another emerged December 4th—only nine days, an astoundingly short period; the third died, and the balance of the larvæ are hibernating at all sizes from fully grown downwards (foodplant, bedstraw). *Venilia maculata*: Took females Bere Wood, Bloxworth, May 29th, 1920, reared on wood sage. Not more than 10 per cent. emerged May, 1921 (last summer), and the balance, about twenty-five pupæ, are passing through this winter, 1922. I will record later what happens to them. *Lobophora viretata*: Beat fifteen larvæ from holly, June 17th, 1921; four emerged August 3rd to 10th, rest of the pupæ laying over. I picked up three larvæ of *Bombyx quercus* July 18th and 30th and August 21st. They all pupated early September, 1920; I presume they were var. *callunæ*. However, one died during the first winter; the other two I expected to emerge May or June, 1921, according to *callunæ* habit, but they didn't arrive, neither did they arrive in August, and on October 1st I broke open the cocoons to see if the pupæ were dead, as I anticipated they must be, but they were both alive and healthy, and remained so until January 10th, 1922, when the first died, and on the 15th the second one died. Had I not broken the cocoons open there is no doubt but they would have lived right through this winter, which goes to prove that *quercus*, or *callunæ*, sometimes passes two winters in the pupa. I beat four larvæ of *Gymnoscelis pumilata* from holly, June 17th, 1921. They emerged very small, and a dove grey coloration all over (most unusual food-plant). *Acidalia dimidiata* double-brooded last August: not usual to double-brood here, generally further north. *Asthenes candida* and *Lobophora sexalisata* both failed to double-brood last summer, although they both usually do here, and the pupæ are passing through the winter. I had two fine specimens (one male, one female) of *formiciformis* emerge September 1st and 3rd, 1921, from sticks of willow I had cut the previous April and May (a very late date for emergence). *Erratic dates*: The most unusual for 1921, and one 1920, of wild captures were the following: *gamma*, December 24th, 1920, just emerged, quite fresh, flying over heather. January 28th, 1921: *hippocastanaria* in plenty, also *pumilata*. February 10th: *lithoriza* on a fence (when with Mr. Newman of Bexley). February 12th: Several *multistrigata*. March 12th: dozens of *hippocastanaria*. May 15th: *hippocastanaria* (very late) showing a long range of emergence from January 28th

above; the same date I took eight or nine freshly emerged *porphyrea* which were some months before their time. *Noteworthy occurrences* which I have taken during the year 1921 for this district are as follows: *exigua*, *vitellina*, *praecox*, *formiciformis*, *straminata*, *complanata*, *hexapterata*, *subsericeata*, *unca*, *costiestrigalis*, *emutaria*, *senex*, *cribrum*, *venosata* and *interjectaria*.—ALFRED V. HEDGES; Sandbanks, Parkstone, Dorset.

COLIAS EDUSA AND C. ELECTRA; PROPORTION OF PALE FORMS.—Referring to Mr. Westropp's notes in the February issue of the 'Entomologist,' and his theory that the ratio of pale to normal females may be higher in warmer climates, I may say that during four years' residence (from 1913) in the Cape Peninsula, S. Africa, I found the proportion of pale forms of *C. electra* little, if any, higher than in the case of *helice* in England; I should estimate the proportion at rather less than 5 per cent. of the total seen. Natal is, of course, considerably hotter than the Cape. At Knysna, where I made a short stay, about one-quarter way from the Cape to Natal, a higher ratio of pale *electra* forms certainly seemed to prevail, but the total numbers seen were hardly sufficient to make a definite pronouncement. At Malta the relative numbers of *helice*, as compared with normal *edusa*, appear to me about the same as in England; of several scores of *edusa* seen at Tunis and vicinity during a holiday last year, I secured only one *helice* and saw no more. As far as my limited experience in the Mediterranean goes, *helice* forms do not seem to preponderate in hotter climates any more than at home. It would be interesting to know whether the two closely-allied species, *C. electra* and *edusa*, exist side by side in any country, such as Abyssinia, which appears to be roughly the limit of their respective zones.—H. F. HUNT; 5, Dockyard Terrace, Malta, February 10th, 1922.

PLUSIA MONETA IN LANCASHIRE.—Dr. Lowther does not say on p. 63 (*antea*) which of the six localities he mentions produced *P. moneta*, but I assume it was Grange. In any case this is not a "farthest north" record, for that species has been recorded from Hart, which is in Durham (see vol. lii). I am awaiting with interest any records of this species beyond that.—C. NICHOLSON, F.E.S.; 35, The Avenue, Hale End, E. 4.

EARLY APPEARANCE OF VANESSA URTICÆ.—On March 12th, 1922, I saw a specimen of *Vanessa urticae* in a sunny spot in a meadow here. The insect was evidently newly emerged and in good condition. The earliest specimen that I saw last year was in a local garden on March 24th.—L. H. BOND; Welby Gardens, Grantham, March 15th, 1922.

ARGYNNIS LATHONIA AT GRAVESEND.—I should like to record my capture on September 4th, 1921, of a specimen of *Argynnis lathonia* in the neighbourhood of Gravesend. It is in fair condition, though obviously not fresh—probably an immigrant I suppose.—DOUGLAS WATSON; Stuart House, Overcliffe, Gravesend.

PYRAMEIS ATALANTA: IMMIGRANTS OR HIBERNATED SPECIMENS?—On Saturday, February 25th, a warm and sunny day, I saw three

specimens of *Pyrameis atalanta*, in quite good condition, in the glades of the New Forest near Lyndhurst Road. Two specimens of *Gonepteryx rhamni*, both males, were also seen, and it certainly looks as if the same weather conditions had brought both species out of hibernation together.—WM. FASSNIDGE, M.A., 47, Tennyson Road, Southampton.

ATTRACTIVENESS OF ELECTRIC LIGHT FOR MOTHS.—In the 'Entomologist' for March, p. 64, the Rev. J. E. Tarbat introduces a subject of much interest, and one which for some years I had intended to write about. Up to about ten years ago the electric lights of Bedford were very attractive to moths, and my friend Mr. W. B. Brocklehurst, who worked them very assiduously, captured an immense number of insects, including *Notodonta tritophus* and *D. templi*. The lamps at that time were open-type arc lamps. A change was then made to gas-filled lamps and with their advent the moths disappeared. It is quite a rare event to see a moth on a lamp at the present time. The Borough Electrical Engineer, Mr. R. W. L. Phillips, informs me that these latter consist merely of an incandescent filament in an atmosphere of argon or sometimes nitrogen. The best arc lamp in the town was fixed on the east side of a wall of the light-generating station and its rays would not be visible for more than 200 yards as houses spread around it in every direction for half a mile to a mile. Our experience was that a very large proportion of the moths taken at the lamps were males, and that many of those taken must have travelled one or two miles. A good example was *B. piniaria*, which is not found within two miles. It is evident therefore that the moths were not solely attracted by light rays. It would appear therefore that moths are attracted to electric lamps by some other means than by light waves, and the change of lamps may assist in determining the nature of this attractive force. Some years ago an article appeared in a daily paper by Mr. Hubert Stringer entitled, "Moths and 'Wireless.' Do moths use wireless telegraphy?" He noted that the males of many moths are attracted great distances by females, much further than could be accounted for by scent, and that males will approach females down wind. They therefore have some means of communication unknown to us. He remarked on the highly-developed antennæ of the males, which would serve as receiving aërials, and that these differ from the female antennæ, which would be the transmitting aërials. He suggested that tests could be made by placing the female in a box of metal or wire gauze, which would cut off any wireless waves. If the male did not come to that box it would support the wireless theory. He states that definite proof could be obtained by making the female's signals audible. In what way, then, does the change of lamps affect this theory? My friend the electrical engineer informs me that a modern argon gas-filled lamp does not propagate any æthereal waves other than light or heat. The arc light, however, can be made to set up oscillatory impulses and most of the powerful wireless stations employ "arc transmitters." In a street arc lamp oscillations of moderate rapidity may be constantly emitted due to the continually varying electrical state of the vapour between the carbons. Mr. Stringer, in the article

previously referred to, says "the final coup would be to imitate the female moth's wireless 'cry' with such accuracy, by means of the artificial circuit, that the males would be deceived into approaching the latter in the belief that a hidden female was calling." It appears we have a very near approach to this in the "arc" lamp. I believe the vibrations of the female are caused by rapid movements of their wings and not by their antennæ.—W. GIFFORD NASH; Clavering House, Bedford.

ATTRACTIVENESS OF ELECTRIC LIGHT FOR MOTHS.—I think your correspondent, the Rev. J. E. Tarbat, is correct when he opines (p. 64) that only certain of the rays of light are the cause of its attractive power for moths. My own experience has been that *all* artificial lights are not attractive, or, at any rate, equally attractive. In the days of the old "ordinary" burners our street gas-lamps here, especially on the outskirts of the town, well repaid the working; but the substitution of the "incandescent mantle" was, entomologically speaking, a retrograde step. Nowadays, for we have not yet attained to the dignity of electric street-lighting, the lamps, though brighter, are not profitable. I do not mean to convey that *no* moths are attracted, but comparatively very few. Neither does a "big blaze" appear to be essential, for experiences at Windermere some years ago proved again that the quality of the light was far more important than the quantity, though one would imagine that an abundance of light, provided it be of the proper kind, would be advantageous. In those days the Windermere electric lights were of a curious old-fashioned pattern, emitting only a dull reddish glow, sadly insufficient for a street illumination, but wonderfully attractive to the moths! A friend of mine worked them assiduously for several seasons and turned up several species considered to be locally rare, viz. *Noto-donta trepida*, *N. chaonia*, *Demas coryli*, *Eurymene dolabraria*, the first three in fair numbers; other desirable moths, *Pachys strataria*, a large dark race of *Anticlea nigrofasciaria*, and *Taeniocampa munda*, were plentiful, whilst the commoner moths, such as *Spilosoma menthastri* and *Gonodontis bidentata* (with one var. *nigra*), came in swarms. The acetylene gas-flame I used myself to find very attractive, and Dr. Lowther has worked the petrol vapour lamps with great success in the district around Grange (*vide* his interesting note in last month's issue). Visiting me recently, my friend, the Rev. A. Miles Moss (British Chaplain at Pará, Brazil), told wonderful tales of the attractive power of the city arc-lamps there, and especially of the success of his private arc-light installation right on the border of the virgin forest. His opinion was "the *bluer* the light, the better!" His accounts of the numerous Sphingid, Arctiid and Notodont visitors on a favourable night made me long for the health and the leisure to join him there—to sample the sport and to share the spoil.—FRANK LITTLEWOOD; 22, Highgate, Kendal, March 3rd, 1922.

NON-ATTRACTIVENESS OF ELECTRIC LIGHT.—Is it not more likely that the "gas-filled" lamps give off some rays which are distasteful in some way to moths, than that they lack some attraction present in the "flame arcs." I know nothing of the technicalities of electric

lighting, but the fact that the new lights give a somewhat whiter light than the old ones suggests that there may be more ultra-violet rays in the former, and these rays are known to be unacceptable to some insects, *e.g.* ants. This opens up a very interesting aspect of the attraction of light for insects, and perhaps Mr. Tarbat can get some definite information on the comparative composition of the respective lights.—C. NICHOLSON.

NEW BEES FROM MADEIRA.—In a paper published in the 'Proceedings of the Entomological Society of Washington,' vol. xxiv, No. 1 (January, 1922), Prof. T. D. A. Cockerell describes four new species of bees from the Madeira Islands. These are *Halictus wollastoni*, *Andrena maderensis*, *A. portosanctana* and *A. wollastoni*. Excepting *A. portosanctana* all are in the British Museum.—R. S.

BOREUS HYEMALIS, LINN. (NEUROPTERA).—In the 'Trans. Ent. Soc. Lond.,' January, 1922, will be found a paper by C. L. Withycombe, B.Sc., giving a full account of his breeding of this aberrant member of the Neuroptera (or Mecoptera, if it is preferred to constitute the Panorpas and their allies a distinct Natural Order of the Insecta). One peculiarity of this insect is that it appears as an imago in November and continues as such in December and possibly longer. The larval period extends from December till August. *B. hyemalis* is a small insect—from 3 to 5 mm. long. The male has four bristle-like wing-remnants; the female is wingless, and has a long ovipositor somewhat resembling that of the Locustodea amongst the Orthoptera. Both sexes possess the Panorpid "beak." Through all its stages *B. hyemalis* lives in moss, especially *Mnium hornum*, Linn. The larva also feeds on moss, but the food of the imago consists of animal juices,* although apparently it does not attack living insects. The paper is illustrated by good enlarged figures of the larva and of the male and female imagines, while a photographic plate shows all stages on a smaller scale.—W. J. LUCAS; Kingston-on-Thames.

THE FARN COLLECTION OF BRITISH LEPIDOPTERA.—It is given to few men to spend so many years of a long life in the formation of a collection of British Lepidoptera as in Farn's case. For little short of three-quarters of a century he was an assiduous worker in the field; he also lost no opportunity of adding any remarkable specimen that came in his way to his cabinet. Sabine, too, was a diligent worker throughout the greater part of his life, more particularly among the butterflies, and at his death Farn acquired his collection and amalgamated it with his own. The auctioneer was therefore justified in saying, when he offered the first portion of this collection at Stevens's Auction Rooms on February 14th, that it contained many "choice lots." The best *Papilio machaon*, a light form, made £4. while the whole series of *Pieris brassicae*, which included several specimens showing minor variations, went for 16s. *Pontia daplidice* in couples sold for 35s. to 55s. per lot, and a very nice one by itself

* After more recent observation, Withycombe considers that normally the imago, as well as the larva, feeds on moss.—W. J. L.

for 50s. Of *Pieris rapae* in lots of about fifty, the best, which included a deep cream-coloured female and forms with united spots, made 32s. 6d., but a single very dark *P. napi* ran up to £9. *Aporia crataegi* in lots of eight or nine sold for 12s. to 16s. per lot. A lot of forty *Leptosia sinapis* which included one cream-coloured male made £4, and another in which was a very white specimen with tips of fore wings creamy £3 5s., while a male *Gonepteryx rhamni* with the costa of left fore wing and most of the hind wing of female coloration sold for the like amount. A female *Euchloe cardamines* with large blotches of orange colour on each of its fore wings made £8, and another with orange streaks on its underside 40s. The series of *Colias edusa* contained many nice forms but nothing of outstanding peculiarity, and the best, a very dusky specimen, in a lot of two, brought £4 10s., others ranging from 30s. to £3 each, while nice forms of *C. hyale*, generally in lots of two or more, went for round about two to three guineas. Good forms of *Dryas paphia* ranged round £4, an exceptionally dark and somewhat rayed specimen ran up to £12, a practically black var. *valezina* £17, and the only really remarkable *Argynnis adippe*, a silvery creamy-white specimen, £20. A fine black *A. aglaia* with rayed borders made £13, and three undersides more or less of the *charlotta* form, £3, £4 10s., and ten guineas respectively. There were nearly a score of well-authenticated *A. lathonia*, and they sold for from 22s. to 52s. 6d. apiece, while an exceptionally fine dark specimen ran up to £8. A fine dark *Brenthis selene* with silver-rayed underside made £8 10s., and a light black-blotched specimen £6 10s. Pale forms of *B. euphrosyne* did not exceed £3, but the most strongly black-marked ran up to £6 10s., £8 10s., and ten guineas; while a remarkable underside with rayed hind wings brought £8 10s. The only really remarkable *Melitaea cinxia* made £6 10s., and good forms of *M. athalia* £4 10s., £5 10s. and £6. Two lots, including among other species the one eighteen and the other eleven specimens of *Araschnia levana*, made only 18s. and 12s. respectively. A curious specimen of *Pyrameis cardui*, described as a "unique white var.," ran up to £16, and a *P. atalanta*, in which the white markings were much "smeared" with black, to £10. The eleven specimens of *Euwanessa antiopa* ranged between 30s. and 50s. each. The only two *Vanessa io* lotted singly were remarkable aberrations and fetched £6 and £7 10s. respectively. A silvery-white *Polygonia c-album* ran up to £21, and one with confluent blotches made £10—both specimens were taken by Farn in 1914; other forms, varying slightly from type, sold for 25s. to 55s. each. *Aglais urticae* with confluent costal blotches and the like brought £2 2s., £4 15s., £5, £2 10s., £2 5s., and 16s. each, and a very pale specimen £1 15s. Black *Limenitis sibilla* made from a guinea to 50s. each, a fine *Apatura iris* of a similar form £11, and another not quite so good £4 10s., while fine typical specimens of the species in lots of five went from 24s. to two guineas per lot. The feature of the sale was a black *Melanarge galatea*, which quickly ran up to the record price of £32. A lot which included a pale buff male *Epinephele ianira* brought £3, one with a cream-coloured specimen £4 10s., a golden-brown male the same price, and a "white underside" 50s. A curious pale golden-ochreous form of *Aphantopus hyperanthus* made £7; a

specimen with broad light borders to ocelli 70s., with lanceolate ocelli 25s. and 30s., and a pale golden male of *Epinephela tithonus* 70s. The total of the day's sale was, in round numbers, £750.—R. A.

THE SALE OF DR. CHAPMAN'S LIBRARY.—This sale, which took place at Stevens's on March 15th, was a notable entomological event, for such an assemblage of books treating on the science has not been seen in the auction rooms for many years. "The Doctor," in his choice of books as in everything else, was philosophical. It was his invariable custom, before making up his mind on any subject that was being studied, to find out everything possible about it and to become acquainted with everything important that had been written upon it; and therefore it was necessary for him to have an exhaustive library of the subjects of his studies at hand for reference. He had for this reason acquired practically all the books dealing with the Lepidoptera of various parts of the world; all the more important works on the other orders; and a large accumulation of books on other sciences, apart from entomology. The gathering of buyers was not what might have been expected for such an occasion, and the dealers, as has unfortunately too often been the case, reaped a rich harvest. Whilst some of the lots, and especially those embracing important British works, fetched fair prices—for there was competition here—others, especially the long series of foreign magazines and the publications of scientific societies, were practically given away. Amongst some of the more important lots and prices were the following: Curtis's 'Brit. Ent.,' complete—£3 10s., about one-fifth of its value; Stephens's 'Brit. Ent.,' £3; Barrett's 'Lep. Brit. Isles,' the large paper edition with coloured plates, £18; Buckler's 'Larvæ' fetched £9—this figure is within a few shillings of its price as issued to subscribers; 'British Aphides,' Buckton, £4 15s.—the issue price was £4 4s.; Fowler's 'Coleoptera of the Brit. Isles,' £12; Stainton's 'Nat. Hist. Tineina,' £2 15s.; Saunders's 'Hemiptera,' £2 15s.; 'Aculeate Hymenoptera,' by the same author, £3 15s.; Verrall's 'Brit. Diptera,' all parts issued, £3 5s.; Harris's 'Aurelian,' a fine copy, £3 10s.; another copy, £1 15s.; 'Novitates Zoologicae,' 25 vols., £8! Amongst the British magazines the following prices were obtained: 'Entomologist,' the first 36 vols., including the rare vol. i (1840), £7 10s.; another series, 1887 to 1920, £5; 'Ent. Mon. Mag.,' 1864–1921, £9; 'Ent. Record,' 32 vols. (all issued), £5; 'Ent. Intelligencer,' 10 vols. (all issued), £1; a complete set of the 'Transactions of the Entomological Society of London' sold for £21—about half what it usually fetches. The slump in foreign magazines and publications of foreign societies embraced the following: 'Stettiner Ent. Zeit.,' 72 vols., £3! 'Annales Soc. Ent. Belgique,' 59 vols., £3! 'Annales Soc. Ent. France,' complete, 91 vols., £3! 'Berlin Ent. Zeit.,' 58 vols., £5. The only non-British magazine that produced a fair value was 'Iris,' of which 35 vols. were sold for £8 10s. I suspect the reason for this was that a certain well-known entomologist, who I know wanted a copy, purchased it. The tragedy of prices was, however, reached in the sale of a very fine copy of Hübner's beautiful 'Sammlung Europäisches Schmetterlinge,' which was sold to a well-known dealer for

£16!—entirely because there was no opposition. The copy, which once belonged to Dr. P. B. Mason, is not likely to be resold at under £60, and but for the fact that one cannot very well acquire duplicate copies of these beautiful but expensive books, the writer would have felt inclined to give the purchaser a run for his money. Hübner's 'Larvæ,' an imperfect copy, realised £9, and his 'Exotic Butterflies,' the modern "Wytzman" edition, £11. The other great German work, Herrich Schäffer's 'Bearb. Schmett.,' had a better fate, and went to adorn the library of one of our best-known lepidopterists, the price paid was £42. Even this, however, was very considerably less than the last copy brought to auction realised, and which was acquired by the writer at Godman's sale. The book is valued in Quaritch's Catalogue at £63. Another ridiculous price was Roesel's beautiful 'Insecten Belustigungen,' which actually changed hands for £4. What are so many of our wealthy Lepidopterists thinking of? They pay £20 or £30 for a variety of a butterfly that has not even the merit of being unique, and is much more abundantly met with in Continental Europe than with us, and yet they allow these most beautiful and interesting old books, which are the vital literature of their science, to pass to the dealers for one-fourth of their current value without making an effort to secure them! There is no doubt but that these books will greatly enhance in price in the not far distant future, as culture becomes more general, and they get scarcer. It must be borne in mind that they were only issued in very small editions. Take Hübner's 'Sammlung,' for instance: in my copy the number of subscribers is given as sixty-nine, and although it is believed others were afterwards added, the total number is not likely to have exceeded 100. We have in Britain, so far as I know, about a dozen copies, of which the majority are in libraries, and the book is much scarcer abroad than with us. It seems pretty certain that in a few years the four or five copies still in private hands will be absorbed into public institutions or sold to Americans. One would think that even to the variety collector such books would appeal, for apart from their merit as representatives of an age that justly prided itself on the exquisite quality and conscientiousness of its work, which will never be reproduced or equalled, the figures are quoted extensively in all the literature of our science, and therefore, if the subject is to be understood, copies must be held for reference. Of course they cannot be borrowed; no library possessing a copy will loan it out on any consideration. Cramer and Stoll, 'Papillons Exotique,' realised £10 10s., and the beautiful 'Lépidoptérologie Comparée' of Oberthur £43. 'Genera Insectorum' reached £20, and Seitz's 'Pal. Lep.' £4 6s. A remarkable purchase was that of Culot's 'Noct. et Geom. d'Europe,' only just completed. The exquisite figures—thousands of them—are hand-coloured by the premier entomological artist of the day, and the cost of the work to subscribers has been about £20. It was bought for £7! Another remarkable bargain was Godart et Duponchel's 'Hist. Nat. de Lep. de France,' usually listed at about £25. The price on Wednesday last was £4! Snellen (Sepp) 'Nederland Insekten,' four volumes, complete, was acquired by the writer for £6. Trimen's 'South African Butterflies' sold for £3, and Hewitson's beautiful 'Lycænidae' for £3 10s. only! Of

Boisduval's 'Icones' there were three copies, which realised £3, £3 3s. and £3 respectively, whilst the only copy of the same author's 'Chenilles' was purchased by the writer for £4 15s. Leach's 'Butterflies of China' sold for £4 10s. The total realised was £731 9s. 6d., which sum ought to have been doubled. A considerable portion of the library was acquired, by the courtesy of the Misses Chapman, for the Entomological Society, and this, of course, did not figure in the sale.—W. G. SHELDON; March 18th, 1922.

RECENT LITERATURE.

Catalogue of Indian Insects. Part I—Acrydidæ (Tettigidæ). By T. Bainbrigge Fletcher. Calcutta, 1921.

HERE we have the first instalment of what promises to be a most useful publication. In addition to the actual catalogue, which itself contains a certain number of notes, we have a bibliography of Indian forms, a short account of the family, and a key to the sub-families as far as India is concerned. In all 169 species are enumerated, one only of which, *Tetrix* (= *Acrydium*) *bipunctatus*, Linn., is British. This family is usually considered to be part of the family Acrididæ (= Acridiidae or Acridioidea of most authors). If, therefore, these grasshoppers, with no pad between the claws and with elongated pronotum, are constituted a family in themselves, the name Acrydidæ, named from the genus *Acrydium* (= *Tetrix*), which appears to be but an incorrect spelling of *Acridium*,* is rather confusing to say the least. To raise the sub-family Tetriginæ to the family Tetrigidæ (or Tettigidæ) would seem to be preferable. W. J. L.

OBITUARY.

LACHLAN GIBB died March 1st, 1922, aged 68 years: thus ran the legend that we read when we laid him to rest in Charlton Cemetery on a beautiful spring day such as he would have loved. A man of wonderful energy, too great perhaps for his bodily strength, for he was not a very robust man, he was throughout his life actively engaged in business, yet he found time to devote to his two chief recreations, his garden and the Lepidoptera, in both of which he took a keen interest from very early days. He had considerable business interests in Canada and spent some years of his life in that colony, during which he made many entomological friends there, with whom he was enabled to keep in touch almost to the last by reason of his visits to Montreal, which after his re-settlement in this country it was his custom to pay regularly every year.

Gibb made no profession of scientific study and it is doubtful if he personally ever made any contribution to literature, although

* Greek, 'Ακρίς = a locust. Schrank and Zetterstedt use the correct derivative, Acridium.

in his frequent letters to correspondents he often conveyed much useful information. His joy was to see the living creature in the field, and to this end he made many arduous journeys both in this country and in Canada. In this wise, some thirty-six years ago, he, in company with the late W. H. Tugwell, set out for Aberdeenshire in search of the then little known *Zygaena exulans*, and not only found the species freely, but brought back much useful information as to its locality and habits (see 'Entom.,' vol. xix, p. 217). Again, soon after *Lycaena arion* was turned up in Cornwall, he wrote to the present writer from Montreal that he was coming over by a certain boat and would meet him in Exeter on a specified evening. "I must see that big blue alive," he wrote. We met in Exeter; we, thanks to friends we fell in with, found the "big blue," indeed, we took quite a number in the one day that we were able to devote to it, and by the evening he had posted the majority of them alive to friends at a distance who, as he said, had not the opportunity of seeing the species for themselves. That was the man! it was never any question of exchange with him, he simply wished to give his friends a share in his own delights.

It was in the spring of last year, while on one of his usual visits to Canada, that he was stricken with the disease that ultimately proved fatal, but on his return to this country, although in an enfeebled condition, the call of the wild was too strong to be resisted, so he set forth for the scenes of his early pleasure with his grandson, a lad of twelve years. They went to Braemar and again found *Zygaena exulans*, they crossed to Argyleshire and got *Z. achilleae*, and returned much elated with their success, but it was the last trip he was to make.


He was elected a Fellow of the Entomological Society of London in 1913, having previously, in 1884, joined the South London Entomological and Natural History Society, and was its frequent benefactor.

It was but a short time before his death that he called the present writer to his bed-side; he was too weak for any lengthy conversation, but he said, "Do encourage the youngsters to take up entomology; it has been such a help to me." So he passed away in peace, and will be missed by a large circle of friends both on this and the other side of the Atlantic.

R. A.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

 **NOTICES OF EXCHANGE** should be received by the 21st of each Month to insure insertion. Not more than Six Lines can be allowed for each

Duplicates.—Machaon (few), Napi (fine), Aglaia, Adippe, Blandina, Davus, Egon (vars.), C. album, Agestis, Bembeciformis, Deplana, Ridens, Chaonia, Chi (vars.), Templi, Populeti, Vespertaria, Gemmaria (dark), Mesomella, Duplaris (vars.). *Desiderata.*—Numerous.—W. G. Clutton, 136, Coal Clough Lane, Burnley, Lancs.

Duplicates.—Salmacis (few), Sinapis, Porcellus, Geryon, Griseola, Bajularia (few), Clathrata, Pulveraria, Tristata, Notata, Rubidata, Straminea, Pudorina, Advena, Pyramidea.* *Desiderata.*—Numerous.—(Dr.) D. A. Dewar, Altyre House, Stanley S.O., Co. Durham.

Duplicates.—Pupæ of Innotata, Campanulata, Asteris. *Desiderata.*—Ova of Illunaria, Bistortata (Crepuscularia), Biundularia, and pupæ of Napi.—H. H. Harrison, The Avenue, Birtley S.O., Co. Durham.

Duplicates.—L. favicolor, E. satyrata* (fine), Scabiosata, Vulgata, Plumbeolata, etc., etc. Northern and western forms down to Pyrales, with full data, required.—Major J. J. Jacobs, "Holmesleigh," Burgess Hill, Sussex.

Duplicates.—Lepidoptera from neighbourhood of Gibraltar. T. rumina, P. daphnice, E. euphenoides, G. cleopatra, D. livornica, C. celerio, and many others. Some set, others in papers. All with full data. What offers in British insects? Northern forms required.—Major J. J. Jacobs, "Holmesleigh," Burgess Hill, Sussex.

Duplicates.—Ova: Badiata, Rupicaprararia, Progenimmaria, Multistrigaria, Munda, etc. Imagines: Numerous. *Desiderata.*—Very many species of Macros in all stages, also Micros.—Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.

Wanted.—Fertile ova of Ennomos erosaria (wild or from wild) or wild larvae later on. Will do my best in exchange.—G. Wynne, 78, Shrewsbury Street, Old Trafford, Manchester.

CHANGE OF ADDRESS.—Mr. H. McD. Edelsten from "Oakhurst," Balcombe Road, Hayward's Heath, to "Buntinghill," Balcombe Road, Hayward's Heath, Sussex.

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—Wednesday, April 5th, at 7 p.m.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. Hibernia Chambers, London Bridge, S.E. 1.—Thursday, April 13th, at 7 p.m., Ordinary Meeting. Thursday, April 27th, at 7 p.m., Paper, "The British Coccidae," by E. E. Green, F.E.S.—Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first Tuesday in each month, and sectional meetings on the third Tuesday. Visitors welcomed at all meetings.—Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.

CONTENTS.

EDITORIAL, 73.

Notes on the Lepidoptera of the Assynt District of Sutherlandshire, *W. G. Sheldon, F.Z.S., F.E.S.* (concluded from p. 57), 73. *Diaphora mendica*, Form *Venosa*, *N.F.*, *Robert Adkin, F.E.S.*, 79. Further Notes on the Odonata of Constantinople and Adjacent Parts of Asia Minor, *Kenneth J. Morton, F.E.S.*, 80. A Synopsis of British Proctotrypidæ (*Oxyura*), *Claude Morley, F.E.S., F.Z.S.*, etc. (continued from p. 60), 82. Neuroptera in Dorset, *F. H. Haines*, 84. Russian Odonata and Neuroptera, *W. J. Lucas, B.A., F.E.S.*, 85.

NOTES AND OBSERVATIONS.—Some Lepidopterous Notes for South Dorset of Unusual Habits, Erratic Dates, and Occurrences for 1921, *Alfred V. Hedges*, 86. *Colias edusa* and *C. electra*; Proportion of Pale Forms, *H. F. Hunt*, 88. *Plusia moneta* in Lancashire, *C. Nicholson*, 88. Early Appearance of *Vanessa urticae*, *L. H. Bond*, 88. *Argynnis lathonia* at Gravesend, *Douglas Watson*, 88. *Pyrameis atalanta*: Immigrants or Hibernated Specimens?, *Wm. Fassnidge*, 88. Attractiveness of Electric Light for Moths, *W. Gifford Nash*, 89. Attractiveness of Electric Light for Moths, *Frank Littlewood*, 90. Non-attractiveness of Electric Light, *C. Nicholson*, 90. New Bees from Madeira, *R. S.*, 91. *Boreus hyemalis*, Linn. (Neuroptera), *W. J. Lucas*, 91. The Farn Collection of British Lepidoptera, *R. A.*, 91. The Sale of Dr. Chapman's Library, *W. G. Sheldon*, 93.

RECENT LITERATURE.—Catalogue of Indian Insects, 95.

OBITUARY, 95.

“ENTOMOLOGIST”

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

THE ‘ENTOMOLOGIST’ SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By *RICHARD SOUTH, F.E.S.* Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

THE ENTOMOLOGIST.

VOL. LV.]

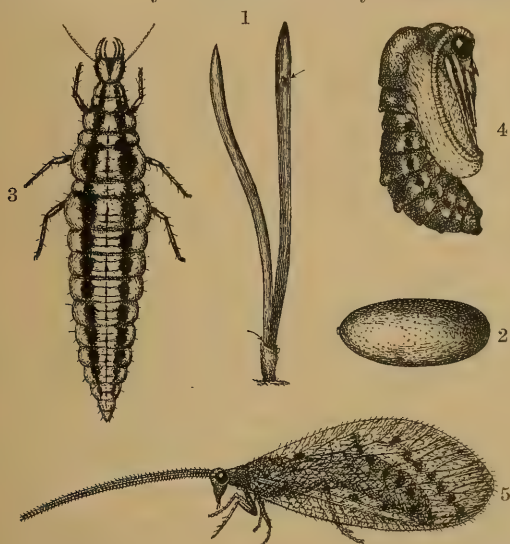
MAY, 1922.

[No. 708

THE LIFE-HISTORY OF *HEMEROBIUS STIGMA*, STEPH.

BY C. L. WITHYCOMBE, B.Sc., F.E.S.

As there have been several records recently of *Hemerobius stigma* being taken in the early part of the year, the following short account of the life-history of this insect may be of interest.



Hemerobius stigma, Steph.—Fig. 1: Pair of pine needles showing positions in which eggs are laid (indicated by arrows), natural size. Fig. 2: Egg, $\times 30$. Fig. 3: Larva, $\times 6$. Fig. 4: Pupa, $\times 6$. Fig. 5: Imago, $\times 4$.

Hemerobius stigma is perhaps one of the most variable of all the brown lacewings, one form common in summer having warm brown wings practically devoid of markings, while the other extreme has greyish-brown, much spotted wings. The last form is in my experience the only one found in winter, but during the warmer months all varieties may be taken. The species is easily captured by beating conifers. On falling into the tray the insects either feign death, bending the antennæ with the legs under the body, or they may jump about for a second or two with a peculiar hopping motion, finally walking away and taking to flight. They are not strong flyers, and are rarely long on the wing. The adults feed on aphids, honey-dew, etc., and, in some cases observed, live for at least eight weeks.

On emergence from the cocoon the eggs in the ovaries are not fully developed and egg-laying does not commence for three or four days, sometimes a week. Eggs are laid singly, attached by their sides to a surface, but sometimes in groups of up to seven in number. The favourite positions are (1) a quarter of an inch from tip of pine needle on inner flat face of same; (2) under the scaly wrapping at the base of a pair of needles and hidden from view. In the first case the female crawls up the needle until the tip is reached; then, on finding she can go no further, the egg is deposited at her body's length from the tip. Less often eggs are laid anywhere on the twigs and needles.

Description of egg.—Size $\cdot 7$ mm. \times $\cdot 3$ mm. Elongate oval, rounded at both ends, but varying slightly in shape. The surface is smooth, broken by many small granular pits. At the micropylar end of the egg is a small white knob. Colour yellowish white when first laid, but in about six days (at 60° F.) colour darkens to orange brown, and a day or so before hatching the eyes of embryo are visible as black dots through the shell at the micropylar end. Average length of egg stage is 9 days at 60° F., or 27 to 36 days in winter at 45° F. approximately.

The larva makes its escape by a small irregular rent in the egg-shell, and is at first of a pale yellowish colour. In two or three days the head markings appear, sometimes also markings on the body, but these latter are usually only visible in the second instar.

Description of third instar larva.—Body almost naked, fusiform, cream-coloured, pale brown or pink, with two longitudinal chocolate-coloured bands. Head dirty white with a brown wedge-shaped central mark widening from behind forwards. Sides of head brown. Eyes black. Antennæ blackish, as also are labial palpi. Jaws dark coloured, brown or blackish, composed of mandibles and maxillæ united to form a tube through which juices of victims are sucked. Body colour is variable, usually creamy white. There is a fine median dorsal dark brown or black longitudinal line, a pair of dorso-lateral longitudinal chocolate-coloured bands, which may be continuous or interrupted at each segment or barely visible. Generally there is also a lateral brown line on each side. Embedded in the dorso-lateral bands of the three thoracic segments are paired shiny greyish-brown sclerites—attachments for muscles. The legs are smoky white in colour, black at the knees; tarsi also darker.

Length of larva when full fed about 7 mm. There are three larval instars.

Contrary to general opinion* the larvæ of *Hemerobius* do not cover themselves with skins; the habit is, however, characteristic of some species of *Chrysopa*.

* McLachlan, 'Mon. Brit. Neur. Plan.,' p. 175, 1868, and 'Cambridge Nat. Hist. Insecta,' pt. i, p. 468.

It is impossible to give, in a brief note such as this, sufficient details to distinguish the larva of *H. stigma* from that of other species. The present description would answer almost as well for larvæ of such distinct species as *H. humuli* and *H. lutescens*; but of course these larvæ are rarely found on pines. Colour in Hemerobiid larvæ is extremely variable, being due largely to the colour of internal organs.

During the greater part of the year larvæ may be found on pines, where they feed on aphids, leaf hoppers, and mites, piercing these with their jaws and sucking out the juices. The larva runs actively with a slight side-to-side motion of the head, the tip of abdomen being used as an additional leg. When at rest it has a habit of lying stretched out along a needle with its head towards the base. The period of larval life varies from 22 to 28 days with an average temperature of 65° F., or 46 to 50 days with a temperature averaging 50° F. When full fed a crevice in the bark or between two needles is sought out and here a loose cocoon of silk is spun, the anal extremity being used as a spinneret.

The cocoon, as in other Hemerobiids, is quite a loose structure of elongate oval shape. In from eight to ten days after spinning the pupa is disclosed. This is at first of a yellowish colour, the eyes and back being brown. All the characters of the adult are now visible, the legs held close together ventrally, the wing rudiments at the sides and the antennæ lying over these and curling ventrally. In from one and a half to three weeks, according to temperature, the pupa has darkened wholly to a deep brown colour, and from now onwards the imago may emerge any day. In summer emergence takes place very shortly after this darkening, but in cold weather the pupa may rest for weeks in this condition or may even pass the winter as such. This is, in fact, the stage in which the coldest weather is passed, but a warm spell even in December or January will cause the appearance of the adult fly.

The pupa struggles for a time within its cocoon, the legs and antennæ being now free, then tearing an irregular hole with its mandibles, it emerges and crawls on to a suitable support. Here the pupal skin is cast and the insect commences adult life. Pairing takes place in a day or so, usually at night, the insects being of nocturnal habits mainly.

Eggs may be laid directly they mature, but in winter only on warm days; these then hatch according to the prevalent temperature, as has been shown.

We see then that this species is really on the wing all the year round in a normal season. At no period have I found its food completely absent, species of *Lachnus* and *Eulachnus*, besides various Psocids, being always procurable, even in the hardest of winters.

NOTES ON *COLIAS CROCEUS*, FOURC. (*EDUSA*, F.)
IN MESOPOTAMIA AND NORTH-WEST PERSIA,
1918-1921.

BY LT.-COL. H. D. PEILE, I.M.S.

I HAVE been much interested in reading Mr. Rowland-Brown's paper on *Colias croceus* in the 'Entomologist' for June (etc.), 1921. I tried while in Mesopotamia in 1918-21 to get a good series of this species, besides others, and when in England selected some for setting, and of these Capt. Riley took 150 for the National Collection. On seeing Mr. Rowland-Brown's article I thought readers of the 'Entomologist' might be interested in this series of *croceus*, such as I was able to capture, and that the rough notes taken from my field note-book might also be of some interest as giving some idea of the appearance of the different broods, and proportion of white to yellow females seen and taken by me. There was much variation among captures on one and the same day at the same spot.

It has always seemed curious to me that although a white form of the female occurs so often among the species of *Colias*, and this form of the female is so common in Mesopotamia, I have never, so far as I know—and I have collected in India since 1908—come across a white female of *Croceus fieldii*, Men.; and I doubt, therefore, the accuracy of Leech's statement in his 'Butterflies of China, Korea and Japan,' that he took a white female of this in Kashmir.

COLIAS CROCEUS IN MESOPOTAMIA AND NORTH-WEST PERSIA.

1918:

May 23.—(Amara.) Very common.

„ 24.—(Amara.) One large white ♀ h.w. all grey, with white centred discal. spot; f.w. grey at basal third. Also a small white female quite different from the above large specn. taken a few minutes before at the same spot.

June 9.—(L. bk. R. Dyala at Jebel Hamrin.) ♂ recognised as brighter orange than usual on the wing, and having white centre to blk. d. spot present though smaller than in *fieldii* (of India).

„ 15.—White ♀ and ♂ orange yellow above and without white centre to f.w. discal. spot beneath.

„ 18.—White ♀ taken.

„ 19.—White ♀ taken, small and damaged.

„ 22.—Large ♂ taken.

July 3.—Pair taken in *côp.* ♂ orange-yellow without any white centre to discal. spot, ♀ white similar to other white females captured here.

- July 5.—Three yellow ♀ ♀ taken, one with large yellow spots on band, one with a few spots slightly indicated, and one with medium spots.
- „ 6.—Large ♂ with white centre to large blk. spot, and another with small plain blk. spots on f.w.
- „ 7.—♀ ovipositing on a common vetch on bank of R. Dyala; this one has indication of pale centre to blk. spot on U.f.w.
- „ 14-17.—(Karind valley, N.W. Persia.) Common both at 5300 ft. and at 6000; U.f.w. discdl. spot plain blk. and large, discdl. cell yellow anteriorly, orange posteriorly, remainder of U. very green.
- Aug. 7.—(Paitak Pass, 2500 ft., N.W. Persia.) ♂ and white ♀ taken.
- Sept. 10.—(Kd. valley, 5300 ft.) *Helice* white ♀, *very fresh*, taken.
- Nov. 16.—Dark *helice* white ♀ chased.
- „ 17.—Worn yellow ♀ taken.
- 1919:
- Jan. 24.—(Kizil Robat, R. Dyala.) Several seen, worn yellow ♀ taken.
- „ 25.—1 ♂, 1 ♀ in *fresh state* taken.
- Feb. 2.—White ♀ taken, the first seen this year.
- „ 11.—Common.
- „ 19.—Common, 1 ♂, 2 ♀ in *very fresh state* taken.
- „ 22.—Several taken.
- „ 25.—Very common, white ♀, one very worn.
- „ 28.—Common.
- Mar. 20.—One ♂ with minute white centre to blk. discdl. spot.
- „ 27.—Fine orange ♀ taken.
- „ 29.—*Freshly emerged* and very common; one ♂ found on fd.-plt. (small trefoil) with its wings not yet dry. One pair in *fresh state* taken in *cóp.* One white ♀ seen.
- April 1.—Very common in *fresh state*. Several of both sexes taken and one white female.
- „ 3.—Two white ♀ ♀ taken, ordinary yellow f. very common.
- „ 6.—Very common, many very fine and fresh females, especially at white scabious-like flowers. One white ♀ taken.
- „ 10.—Very common, many very fine ♀ ♀ about; six white ♀ ♀ taken.
- „ 21.—Abundant. Three white ♀ ♀ taken, others seen. One of these three was taken in *cóp.* with *crocus* ♂. About 8 a.m. one is very likely to put up two or more white ♀ ♀ about stony slopes near the camp.

May 21.—(Kizil Robat.) ♂, bright orange upperside and yellow U.

June 28.—White ♀ seen; yellow-orange ♀ with white centre to discal spot on U f.w. taken; a very brightly coloured ♂ seen.

July–Oct.—(Busy at Kirkuk.)

Nov. 3.—(Baiji, Rt. bk. R. Tigris.) Several rather worn seen.

„ 6.—Very common in worn state.

1920:

May 25–26.—(Baiji.) Larva pupated (♂ *croceus* emerged 1 June). Fd.-plt. lucerne.

June 3.—Very common about lucerne; white female taken *in cōp.*, two other white ♀♀ taken, one ovipositing on lucerne. Yellow female also seen ovipositing. Does not pause long to lay the egg; egg laid singly on middle of half of upperside of medium-sized leaf.

„ 4.—V. common about lucerne: pair (both sexes yellow) taken *in cōp.*, the female being in very fresh state. Another fine fresh female being courted by two males, and *apparently recently emerged*, taken.

Two white ♀♀ taken having much grey about them above. Yellow female seen ovipositing on lucerne.

„ 8.—Very common, seven white females taken and some very fine males.

„ 9.—One white ♀ taken and another seen.

„ 13.—At lucerne; one very good example of true *helice* form, cream coloured with tinge of orange about the postr. margin of the fore wings; grd. col. beneath yellow. The only true *helice* yet taken here, although white females are common, and it is quite distinct from these. Several white females were taken in about half an hour (8.30 to 9 a.m.) at the same spot. This *helice* female laid several eggs of the usual spindle shape in the paper envelope.

„ 15.—A white ♀ with large amount of grey at base of f.w., but orange discal spot on h.w.

„ 19.—White ♀ taken, another seen.

About 6 p.m. took a remarkably large white female. Took larva of *croceus* this morning on lucerne.

Colour uniform dark green matching very well the colour of the lucerne leaves, lateral white line with red dot on it at each segt. With a temperature of 114° inside my tent this larva was not happy inside an inverted tumbler with plant in water. In the cool of the evening it showed a little more sign of life when put on lucerne inside an old net.

June 20-21.—This larva pupated, head upwards on main stem of lucerne plant; colour, semi-transparent green (pea-green), a little lighter than the lucerne leaves. White lateral line along thorax and abdomen, with dark brown dorso-lateral mark as in the other pupa. The colour closely resembles that of the leaves around it.

„ 26.—Markings of female *croceus* conspicuously showing through the pupal skin, and the butterfly emerged about 5 a.m. 27th.

1921:

Oct. 28.—(Baghdad.) *Colias croceus* seen.

Nov. 9.—(Baghdad.) *Colias croceus* male taken in worn state.

„ 10.—Six seen in garden, three at one time.

„ 15.—Remarkably common in garden in last few days.

„ 28.—Male seen courting settled female, both worn specns.

Capt. N. D. Riley, having selected a series of 150 of my specimens, as stated above, for the National Collection, writes of them as follows:

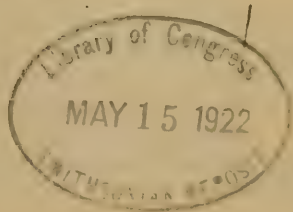
“A magnificent species. The Persian specimens cover the dates 14/7/18-10/9/18. The Mesopotamian series represent captures in nearly every week of the months January-July (middle). As regards size they range from an expanse of 3.7 mm. (♀ Jebel Hamrin, 3/7/18), to 5.4 (♀ Amara, 26/5/18). The January and February specimens are noticeably and consistently smaller than those of any other month, with the exception of the one very small female mentioned above, and an exactly similar one from same locality dated 10/6/18.

“The amount of variation in colour and markings is remarkable. One male (Kizil Robot, 22/3/19) has ground almost lemon-yellow instead of orange; some examples in which all the veins are marked with yellow across the outer marginal border are referable to *ab. faillae*, Ste.

“Of the females, almost exactly 33½ per cent. [of those selected] are of the white *helice* form; two of the *f. aubuissoni*, Caradja, intermediates in which the yellow has failed; one of the ♀ *f. helicina*, Oberth., an intermediate form in which the red pigment is absent, leaving the specimen a delicate lemon-yellow.

“For the rest no two specimens are alike, so it would serve no useful purpose to go into details.”

Mhow, India;
January 31st, 1922.



TRICHOPTERA IN DORSET.

BY F. H. HAINES, M.R.C.S., L.R.C.P.

THE following species of Trichoptera were met with during some seasons in which attention was paid to this Order in the Wareham district. *Phryganea grandis*, Linn., common round the lake in Morden Park in May and early June, resting by day on trees and other objects near. It associates itself pleasantly with the spirit of the spring morning. *P. striata*, Linn., occurs with it, but less commonly. It is found also among the osier beds of the backwaters of the Frome. *P. varia*, Fab., is abundant in July, especially at Morden, hiding in the crevices of fir trees growing near heathland ponds. *Colpotaulius incisus*, Curt., is found on Tadnoll marsh in May, harbouring in the coarse growth to run up the rushes fast and fly a short way if disturbed. *Glyptotaelius pellucidus*, Retz., is very abundant, breeding in the small ponds found in copses as well as in the larger existing in certain woods. It shelters in the very low bushy branches of the oak trees round its haunts, and is most numerous in early summer. The commonest species of *Limnophilus* are *L. marmoratus*, Curt., *lunatus*, Curt., *centralis*, Curt., *affinis*, Curt., *auricula*, Curt., and *sparsus*, Curt., most of them abounding. *L. marmoratus* frequents rivers in summer and early autumn, and is very common on the Frome and also round the lake (through which a stream runs) in Morden Park. *L. lunatus* inhabits the still waters of ponds and marshes throughout the area chiefly in late summer and autumn. *L. centralis* is found near standing waters, but also far away from even a pool in the fir-woods. McLachlan suggested that it might breed in spongy bogs where there was no surface water. Judging from the positions in which *L. auricula* and *sparsus* are found, also often in woods, distant from anything beyond puddles and damp hollows, they may breed in these spots amid dead leaves in very shallow water, which is occasionally reduced to mere dampness. Abounding everywhere *auricula* occurs from May to autumn. *Sparsus* is largely a May and summer insect, but it continues later. They are easily secured by shaking pine branches into a net in the fir districts. *L. affinis*, considered rather a woodland species, occurs in numbers amid the *Spartina* and other growth on the shores of Poole Harbour: evidently a maritime tendency is not exceptional. It occurs earlier, but I have met with it most freely in autumn. *L. rhombicus*, Linn., is commonest in June about Morden Park lake in the reeds and rushes. *L. elegans*, Curt., occurs rather uncommonly at Morden near heathy swamps, and it is to be beaten out of the lower branches of oaks where the woods and heathlands meet. I have taken *L. griseus*, Linn., in Coombe Wood and near Tadnoll marsh in April

and May, but it is not common. *L. luridus*, Curt., another rarer species, occurs in June and July about ponds at Morden, East Lulworth, and on the backwaters of the Frome at Ilford, evidently breeding in either still or slowly moving water. These three species are local. *Anabolia nervosa*, Curt., is very abundant on the Frome system and also on the Morden Park lake at the entry and outfall of the stream. It may be seen in multitudes running up the flags and rushes evidently when first hatching out, on bright warm days from early to late fall. It will even settle on the collector sitting by. At other times the insect hides by day in the bank growth. *L. rhombicus* has a similar habit. Of species of *Stenophylax*, *stellatus*, Curt., is far commoner than *latipennis*, Curt., coming to light freely like the very common *permistus*, McLachlan. *S. stellatus* is found mostly in September, occurring often in Winfrith, bred from the village brook, also on the Frome and on the Puddle at Carey. *S. latipennis* occurs at Iford in September. Nearly all my specimens of *permistus* have been taken in April and May, perhaps hibernated. It occurs freely at Winfrith, Bockhampton, and along the Frome, often harbouring of a day in outhouses. *Micropterna lateralis*, Steph., occurring along our heathland brooks in June in those spots "that seem to lie sacred to flow'rets of the hills, and sacred to the sky," is retiring and seldom seen. *Halesus radiatus*, Curt., is very numerous by streams at Morden, Moreton and Iford. *H. digitatus*, Schr., is not so common, but occurs on Winfrith Heath by the Frome. These species sometimes dance gregariously in the sunshine. They often come to light at night. *Drusus annulatus*, Steph., has occurred in May on our Winfrith brook, although this is but very rarely swift. It is not common. I have no record of *Chaetopteryx villosa*, Fab., from this area, though it will surely occur on streams here, as in other parts of Dorset, from early to late autumn. The variable *Sericostoma personatum*, Spence, is abundant on all the rivers, and lends some animation in summer to many a stream as it wends its way through the green pastoral tracts. I have seen it ovipositing in the pond in Morden Park. Like most of the Sericostomatidae it does not travel far from the water, and flies by day and of an evening readily. *Notidobia ciliaris*, Steph., is abundant, especially in May, at Lower Bockhampton, Iford and Moreton, and is of similar habits, and very noticeable, resting on the herbage. *Goera pilosa*, Fab., is common in June and July at Iford and Moreton. *Silo nigricornis*, Pict., is another frequent species flying over rivers in the sunshine at Moreton, Stafford, and Bockhampton, notably in May, but also later in the season. The whole family tends to be diurnal. *Lepidostoma hirtum*, Fab., another of our common river caddis-flies, is found at East Stoke, Holme and Moreton in July, August and September. *Brachycentrus subnubilus*, Curt., swarms on the Frome in April and May, sporting

in crowds over furze bushes by the banks at Iford. I have found it on the flowers of Umbelliferae, so that evidently, as with *S. permistus*, which comes to sugar, and *L. bipunctatus*, which comes to ivy-blossom, the mouth apparatus is not entirely atrophied. The species of *Beraea* occur in the various backwaters and ramifications of the Frome, where the water is slow, shallow and full of plant-growth, particularly in spring and early summer. I have taken, especially in May, *Beraea pullata*, Curt., at Iford and Tadnoll, *maurus*, Curt., on Winfrith Heath, and *articularis*, Pict., at Tadnoll, to quote but a few localities for these insects. *Beraeodes minuta*, Linn., occurs at Morden in May. *Molanna angustata*, Curt., is common at Tadnoll and Morden in May and early June, and may be taken resting by day like a Crambite, but with the legs out sideways, on the walls of the open boat-house by Morden lake, as well as at the roots and on the stems of reeds, rushes and flags, where they stand thickly by the water. *Odontocerum albicorne*, Scop., is not common. I have taken it by the Puddle at Culeaze on herbage. *Leptocerum aterrimus*, Steph., is very common on the pond at Morden Park in June. *L. cinereus*, Curt., is abundant in July on the Frome and its branches at East Stoke, Moreton and Tincleton. It often flies in large clusters just above the water in the quiet of the evening. *L. albifrons*, Linn., occurs freely by beating the trees just below the mill at East Stoke in July and August, as does, more rarely, *L. dissimilis*, Steph. *Mystacides azurea*, Linn., is abundant on backwaters and ponds, with a current through them, as at Morden and East Lulworth, from May to August. *M. longicornis*, Linn., is common round Morden Park Lake in May and June. *Triaenodes conspersa*, Ramb., is not uncommon at East Stoke mill, Holme Bridge and Moreton in July and August. *T. bicolor*, Curt., a pond species, occurs at Morden Park in July, as does *Adicella reducta*, McLach., a water-fall species, in June. *Oecetis ochracea*, Curt., is very common amongst the rushes round the large pond on Morden Heath from June to September, flying fairly fast, if awkwardly, over it of an evening. I find *O. testacea*, Curt., chiefly near East Stoke mill on the mill-stream, also at Tadnoll in July and August. Hydroptilidae are apt to come to light in multitudes, and by day they may be found running over bridge parapets, lichen-covered stones, and similar objects near water with quick alertness. *Hydroptila sparsa*, Curt., occurs very commonly on the Puddle at Culeaze, at Tadnoll, and on the Frome at Bockhampton in May and June. *H. maclachlani*, Klap., is found freely on the Frome Bridge at Bockhampton. *H. forcipata*, Eaton, is found at Tadnoll and Morden in May and June. *Orthotrichia angustella*, McLach., occurs at Tadnoll in April. *Oxyethira costalis*, Curt., is exceedingly abundant at the Morden Park lake. *O. tristella*, Klap., is found at Tadnoll in May, and *O. falcata*, Morton, in the Winfrith neighbourhood. *Hydropsyche pellucidula*, Curt.,

occurs in May and June at Iford ; *fulvipes*, Curt., rather particularly known as a Dorset insect, in May, June, and July, at East Stoke, Iford and Bockhampton ; *angustipennis*, Curt., from May to September, is abundant at Winfrith and Iford ; *guttata*, Pict., from May to August, is very common at Winfrith, Iford and Moreton ; the males often dance in groups in sunshine near the Frome, like those of *angustipennis*. *H. lepida*, Pict., is abundant at East Stoke mill in July and August. *Wormaldia subnigra*, McLach. (females only), occurs in August and September at Studland Heath, near a heathland spring, and at Morden at the outfall of the Park lake. *Chimarra marginata*, Linn., is very common on moss-grown boulders, hatches and such objects in May, June and July on the swifter reaches of the Frome at Moreton. *Plectrocnemia conspersa*, Curt., occurs at Morden in May by the rushing outfall and stream from Morden Park lake. It tends to that golden spotted appearance so common in caddis-flies frequenting swift streams, cataracts over boulders, and places where light and shade and spray make such colouring harmonise with the surroundings. *Polycentropus flavomaculatus*, Pict., found at Morden, Moreton and Bockhampton, is extremely abundant from May to September. *P. multiguttatus*, Curt., though also a stream-frequenting insect, is common on the Morden Park lake, but less so than the last. Here also the pond-breeding *Holocentropus dubius*, Ramb., occurs in May and June, and at East Lulworth lake, as does, more rarely, *H. picicornis*, Steph. *Cyrtus trimaculatus*, Curt., abounds at Morden Park lake and at Holme in May, June and July. *Tinodes waeneri*, Linn., is ubiquitous on all our rivers and ponds as at the Corfe River, Morden, East Lulworth, Winfrith, Moreton, etc., from May to September. *Lype phaeopa*, Steph., is often met with, as at Moreton and Morden from May to September, in the slower flowing waters, as is, not rarely, *Psychomyia pusilla*, Fab., at Moreton and Iford from May to September. *Rhyacophila dorsalis*, Curt., is general on all our streams from May to October, even breeding in the small Winfrith brook, whence the imago flies indoors to light. But the species of *Rhyacophila* are usually most at home glancing and flying in the roar, rush and sparkle of tumbling waters amid precipice and peak ! *Agapetus fuscipes*, Curt., is very common on the Frome system at Moreton, Stafford and Bockhampton from May to September. I have *A. comatus*, Pict., from Moreton in May, but it is much scarcer than the preceding.

The foregoing will give a total of 73 species found in the Wareham district. C. W. Dale's British list, revised by K. C. Morton in 1907, gave 174 British species. Dale's Glanvilles Wootton list gives 42 species, of which 9 are not in my list : *Phryganea minor*, Curt., *Grammotaulius atomarius*, Fab., *Limnophilus vittatus*, Fab., *Chaetopteryx villosa*, Silo, *pallipes*, Fab., *Leptocerus bilineatus*, Linn., *Mysta-*

cides nigra, Linn., *Agraylea multipunctata*, Curt., and *Micropterna sequax*, McLach. But as the common *S. permistus* is not recorded at all, it suggests that this species is meant. I have reckoned Dale's *Hydroptila tineoides* as *sparsa*, not *femoralis*, Eaton. *L. vittatus*, *S. pallipes* and *M. nigra* seem curious omissions from my list. *Neuronia ruficrus*, Scop., is recorded from Holnest, and *Apatania muliebris*, McLach., from Blandford, bringing the Dorset total to 83. I have a list of 39, most of which, judging from their habits and distribution elsewhere, would probably be found were the county thoroughly worked throughout. This would give Dorset 121 species. The remaining 53 species are probably too northern or alpine in habit, or require haunts of a kind not developed in Dorset, such as wide-spread fen country and broads on the one hand or mountain torrents on the other.

Brookside,
Winfrith,
Dorset.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 83.)

5. PROCTOTYPES PARVULUS, Nees.

Codrus parvulus, Nees, Hym. Mon., ii, 1834, p. 360, ♂ ♀.
Proctotrypes parvulus, Hal., l.c., p. 14, ♂ ♀. *Serphus parvulus*,
André, l.c., p. 315.

A little-known species. Germany "in Fungis, præsertim in Boletis circinante, *Mycetophyllarum* larvis infestato, gregarius; Septembre et Octobre mensibus in memoribus" (Nees); and Finmark in July. Not common in woods during autumn (Haliday); females gregarious in Boleti (Walker). I have bred this species in some numbers from *Boletus*-fungi on old elm-trees about Ipswich; but, as I have already remarked ('Trans. Entom. Soc.', 1907, p. 39), it is impossible to determine if these were parasitic upon the dipterous genus *Cecidomyia*, the beetles *Orchesia micans* and *Phalacrus corruscus*, which were also bred therefrom, or upon *Meteorus obfuscatus* and *Thersilochus orchesiæ*, Morl., which were themselves parasitic upon the above *Orchesiæ*; judging solely by the comparative bulk of these various insects, it is probable that the *Proctotrypes* was a direct parasite upon this Heteromeron. Felden, in Herts, doubtless bred (Piffard); bred from *Orchesia micans* at Luccombe Chine, in Isle of Wight, on May 7th, 1914 (J. C. Pool); several bred from *Diphyllus lunatus* in *Sphaeria concentrica* at Oxford (Lyle), who has proved

the order of its host by breeding both sexes and a nymph during October, 1915, from *Coleopterous* larvæ, to which the parasite is in this case still actually attached. On a single sunflower during mid-September at dusk in Ipswich.

6. PROCTOTRYPES GRAVIDATOR, Linn.

Ichneumon gravidator, Linn., Syst. Nat., i, 1758, p. 565; Oliv. Encycl. Méth., vii, 1792 (*nec*. Thunb.). *Banchus gravidator*, Fab. Syst. Piez., 1804, p. 128. *Codrus gravidator*, Jurine, Nouv. Méth., 1807, p. 309, ♀; Nees, *l.c.*, p. 354; Zett., Ins. Lapp., i, 1838, p. 416. *Proctotrupes gravidator*, Lep. Encycl. Méth., x, 1825, p. 208; Hal., *l.c.*, p. 14, ♂ ♀; Thoms., *l.c.*, xiv, p. 412; Voll., *l.c.*, p. 29, pl. xviii, fig. 3, ♀.

The colour of this species is variable, and Haliday instances examples with femora and antennæ nigrescent, and others with black abdomen and infusate legs, having only base of both tarsi and tibiæ dark ferrugineous; my darkest male, taken at Market Rasen, in Lincs, during June, 1912, has nothing but base of second segment and part of tibiæ dull rufescent. That this species has the power of, at least occasionally, stinging, is proved by W. Rollason, who wrote to me that his little daughter was quite sharply stung by one in his garden at Truro on October 16th, 1909; it "caused a raised white bump, which remained for about four hours."

In sunny fields, frequent everywhere in summer; Sweden, Italy (Haliday); all Europe to Sicily (Kieffer); bred from galls of *Cynips Kollari* by Fitch ('Entom.,' xiii, p. 260), and according to Vollenhoven, from the common British fungus-gnat, *Boletophila fusca*, etc. I have found it a not uncommon species in dry places, such as the coast sand-hills and the "Breck" of N.W. Suffolk; never taken on flowers, but sometimes hiding beneath *Erodium cicutarium* and swept from gorse; rarely sheltering in rabbit-holes. Evenly distributed through the third quarter of the year from June 10th to September 27th, at Foxhall, in 1896, Ipswich, Herringswell, Belstead, Kessingland, Wangford, and common about Brandon at the end of June, especially so in 1918, though a female was once swept from nettles at Belstead so late as October 29th. Copthorne Common, Surrey (Wilson Saunders, 1871); Felden, in Herts (Piffard); Faversham, in Kent (Chitty); Lichfield, in Stafford, 1917 (Lance Carr); Selby, in Yorks (W. J. Fordham); apparently very rare in Notts, whence Prof. J. W. Carr has sent me but one female, taken at Bulwell Hall on August 17th, 1917.

7. PROCTOTRYPES DEVAGATOR, Oliv.

Ichneumon devagator, Oliv., Encycl. Méth., vii, 1792, p. 192. *I. campanulator*, Fab., Ent. Syst. Suppl., 1798, p. 227; Piez., p. 99. *Proctotrupes campanulator*, Klug., Mag. Ges. Nat., i, p. 73; Voll.,

l.c., p. 29, pl. xviii, fig. 4, ♀. *Eriodorus bimaculatus*, Walek., Faun. Paris, ii, 1802, p. 47. *Codrus campanulator*, Nees, *l.c.*, p. 353, excl. ♂. *Serphus divagator* (*sic*), André, *l.c.*, p. 292. ♀.

Modern authors have seen fit to regard this female as distinct from *P. gladiator*; personally I am convinced that it is no more than a brachypterous form thereof, for the entire structure is identical throughout. Chitty fully concurred in this opinion.

Italy, Hungary, Germany and France (Kieffer); it has recently been bred in some numbers in southern Europe from galls of the Dipteron, *Lonchæa lasiophthalma*, on *Dactylon*; Vollenhoven, however, records it from the fungus-gnat, *Sciophila lim.*, none of which are British; it is said to occur in September, sometimes under stones on the ground. Unknown to Haliday, and Westwood's 1840 figure obviously refers to *P. gladiator*; apparently hitherto not found in Britain, and erroneously recorded hence. I am glad to be able to definitely reinstate this name in our fauna by the capture of a typical specimen running on the bare sand during the afternoon of July 26th, 1904, on Foxhall Plateau, near Ipswich, in Suffolk.

8. PROCTOTRYPES GLADIATOR, Hal.

Proctotrupes gladiator, Hal., *l.c.*, p. 10, ♀. Vollenh., *l.c.*, p. 30, fig. 7, ♀. *P. bicolor*, Hal. *l.c.*, ♂. *P. brevipennis*, Westwood, *Introd.*, ii, 1840, p. 169, fig. lxxviii, ♀. *Serphus gladiator*, André, *l.c.*, p. 294, ♂ ♀.

Very rare in northern Ireland. Haliday took a female running among grass roots on a sunny sandy cliff; near Dublin (R. Ball); southern France (Walker); Sweden, Switzerland, Russia, Hungary (Kieffer). In my experience it is less frequent than *P. gravidator*, but not rare by sweeping short herbage in the most arid and sandy places, though not confined thereto; sometimes on flowers of *Compositæ*, and by beating bushes in woods. It has occurred to me only during September at Ipswich, in 1897; Depden, Frostenden, Covehithe Broad on *Tanacetum vulgare* and *Senecio Jacobæa*, and Baylham, except once, when a male was swept as early as June 22nd at Brandon. These Suffolk dates are connected by two other males found at Devonport during July (*P. de la Garde*) and Southampton on July 25th (*H. S. Gorham*); it has also occurred at Felden, in Herts (*Piffard*), and during 1900 at Westleton, in Suffolk (*Elliott*).

NOTES AND OBSERVATIONS.

VANESSA ANTIOPA IN GLOUCESTERSHIRE.—On September 12th, 1921, a specimen of *Vanessa antiopa* was captured near Speech House, Forest of Dean, Gloucestershire, by Mr. Heslop, of 34, Henleaze Gardens, Durdham Down, Bristol, which was afterwards shown to me.—GEO. C. GRIFFITHS; Penhurst, 3, Leigh Road, Clifton, Bristol.

HYDROECIA MICACEA f. BRUNNEA AT SEAFORD.—I should like to report the occurrence of *H. micacea* var. *brunnea*, Tutt, at Seaford last August. I should be interested to learn if this form has occurred in Sussex before. In general appearance it is very similar to *H. petasitis*.—B. H. ARMSTRONG; 7, Sandford Road, Bromley, Kent.

UNUSUAL OCCURRENCE OF PIERIS RAPÆ.—On March 1st a newly emerged *Pieris rapæ* was brought to me, having been taken in the Head Office of the London County and Westminster Bank, Lothbury. It was a cold day, and the nearest square where the larvæ could obtain food is, I think, Finsbury.—STANLEY A. BLENKARN; Burford Lodge, Boxhill, Dorking.

EARLY OCCURRENCE OF SMERINTHUS POPULI, ETC.—This morning a ♀ of *S. populi* was brought to me which had been taken at light in a barrack-room near Shooter's Hill some time during the last week of January. It was in fairly good condition and had deposited a few eggs which had proved fertile, but the young larvæ had died. On February 28th of this year Mr. M. Gaitskell, of Denstone College, took a specimen of *C. quadripunctata*, also at light.—GUY STANTON; Devon Lodge, Green Lane, Eltham, S.E. 9, April 16th, 1922.

LYCENA ASTRARCHE VARS. IN NORTH LANCASHIRE.—On July 23rd, 1917, I took a fine specimen of *L. astrarche* with the full complement of spots on upper side of wings pale canary yellow in colour, in place of the usual reddish-orange spots. The spots are large and well developed. This is referable to var. *pallidior*, Obth. On July 2nd, 1921, I was fortunate in capturing a specimen with the spots white, exactly the colour of the fringes of this species. It is also in first-class condition, but does not contain the full complement of spots. On the fore wings there are only three spots near the inner angle, and five better developed on the hind wings. This is referable to var. *graafii*, ver Huell. According to Tutt's 'British Butterflies,' vol. ii, p. 256, *pallidior* does not appear to have been previously recorded in the British Isles. He states that there is a specimen in the British Museum Collection taken in Norway, July 15th, 1887, from the Elwes Collection. With reference to *graafii*, the previous three or four specimens have all been taken in Holland, and this also appears to be new to Britain (v. Tutt, l. c.). On July 3rd, 1921, I took a variety of underside. The fore wings have four spots in the series and the usual spot in end of cell, but in the hind wings there is only the white discal spot, and another spot near the upper margin present, the usual row being entirely absent. On July 7th, 1921, another was taken with the fore wings containing the spot in cell well developed, but in the usual series only two very small spots present. On the hind wings only the white discal spot, the spot near upper margin, and the upper spot in usual series, are visible. The

butterfly is fairly common in North Lancashire, and vars. *allous*, Hb., *semiallous*, Harrison, and *albiannulata*, Harrison, are of frequent occurrence. The pathological specimen, taken on July 21st, 1906, mentioned in Tutt, vol. ii, p. 231, which has the right hind wing of a silvery colour as in *H. phlaeas* ab. *schmidtii*, but with the orange-reddish spots normal, was kindly sent to me many years ago by Mr. Harrison, and is in my collection along with all those mentioned above.—ALBERT E. WRIGHT; Brunleigh, Grange-over-Sands.

ACROBASISTUMIDANA, SCHIFF = VERRUCELLA, Hb., = RUBROTIBIELLA, F.R., AT DARENTH.—In the catalogue of the second portion of the Farn Collection I noticed that there was included in Lot 433 five examples purporting to be this extremely rare British species, and for their sakes I acquired the lot. A close examination, before the sale, of course, convinced me that they were actually *A. tumidana*. The history of this species as British is one of the most remarkable of any of our Lepidoptera. It was first taken by R. McLachlan, in 1858, at Forest Hill, on the outskirts of London, apparently in some numbers. Odd specimens have since been taken at wide intervals in Hants, Dorset, and Suffolk. The Farn specimens are labelled in Farn's own writing "Darenth"; they bear the dates August, 1873 (1), and August, 1875 (4). They are mounted on the ordinary gilt pins, and judging by the setting, were probably taken by Farn himself. At this date his labels, at any rate amongst the *Phycids*, did not state the name of the captor. It seems rather remarkable that these specimens were never recorded; but then Farn hardly ever recorded any of his captures, and one supposes, too, that the too well known and frequented locality from which they came—Darenth—prevented him, for reasons of strategy, from disclosing their origin, or even the fact that he possessed them.—W. G. SHELDON; April 12th, 1922.

BUTTERFLIES ATTRACTED BY HUMAN PERSPIRATION.—The small collection of Lepidoptera enumerated below was received some months ago from my brother-in-law, Mr. Frank B. Hinchliff, who had recently obtained them while on a fishing expedition in Paraguay and Misiones in company with his cousin, Mr. Theodore Hubbard. He had no net nor any collecting apparatus with him, and his account of the means by which the butterflies were captured is so unusual I feel it should not be left unrecorded. He writes: "I have just returned from a six weeks' trip to Paraguay and Misiones, where I stayed at T—'s estancia—a very interesting trip indeed. . . . Butterflies were not in hundreds, but in thousands. It was a sight to see poor T— trying to fish with swarms of 'Purple Emperor'-like butterflies and others settling on his face and hands like mosquitoes—he counted nine different varieties at one time on his rod alone, and his face was covered with them, lapping up the perspiration that flowed down his cheeks. 'Swallow-tails' of all sorts and sizes simply swarmed. Some I failed to get, having no net, but I caught others by hand off my rod and face." With regard to this curious attraction that human perspiration seems to have for butterflies, I may mention that I have had many opportunities of collecting in the tropics, in both hemispheres, yet such an experience never happened to me, although I

was usually in a most profuse perspiration, with scores of butterflies around me; nor have I ever read or heard of anything like it.* In reply to my brother-in-law's letter I wrote and told him how interesting his account was, and begged him to try and send me further particulars. His answer reached me a short time ago, so that I am able to add a few more notes: "The 'Purple Emperors' (*Apatura laurentia*, Godt.) were not sitting on me in ones or twos, but at one time I must have had a dozen, and they were so tame that we had what we called a 'pet' one. Several times we caught it between our fingers and thumbs and threw it up into the air, but it always came back. . . . They were a perfect nuisance to one—they alighted all over one's face and hands and arms, and sucked up our perspiration. They seemed to prefer T—s to mine, though they were at times like mosquitoes buzzing and settling on me, and kept me busy brushing and waving them off. I found that the butterflies were also attracted by the 'droppings' of tapir, or 'carpincho,' in a clearance of the forest, and were swarming over the dirt." In a later letter my brother-in-law writes, in reply to queries from me: "As regards scent, sometimes we rubbed 'citronella' on our hands and necks as an anti-midge protection. It is supposed to keep insects away, but I do not think it attracted the butterflies, as they settled on face and clothes as well." I am indebted to Mr. N. D. Riley, of the British Museum (Nat. Hist.), for kindly giving me the names of the insects. Of course it was only the butterflies that were attracted in the way described; the moths were obtained otherwise. Danainæ: *Ituna ilione*, Cram. Satyrinæ: *Euptychia hermes*, Fabr.; *Pedaliodes phanias*, Hew. Brassolinæ: *Opsiphanes invirae*, Hübn. Nymphaliniæ: *Coloenis julia*, Fabr.; *Hypanartia lethe*, Fabr.; *Dynamine tithia*, Hübn.; *Catagramma candrena*, Godt., and *C. pygas*, Godt.; *Marpesia neleus*, Sulz.; *Siproeta trayja*, Hübn.; *Adelpha cytherea aca*, Frühst.; *Apatura laurentia*, Godt.; *Anaea memphis*, Feld. Pierinæ: *Pieris mandela*, Feld. Papilioninæ: *Papilio anchisiades*, Esp.; *Papilio torquatus*, Cram. Syntomidæ: *Eurota picta*, H.S. Saturnidæ: *Hyperchiria*, sp. Geometridæ: *Heterusia quadriplicaria*, Hübn.—G. F. MATHEW; Dovercourt, Essex.

THE FARN COLLECTION: SECOND AND THIRD DAYS' SALE.—The sales of the remaining portions of this well-known collection, which were held at Stevens's Rooms on March 14th and April 4th, were again well attended, and although it was sometimes difficult to place long series of some of the commoner species even at five or six shillings, anything "at all out of the ordinary" easily found buyers, and often at very good prices. Included in the two days' sales there were twenty-six specimens of *Chrysophanus dispar*, of which the best easily made £10 to £13, grading down to £5 or £6 for those having less satisfactory condition and data, while an exceptional specimen with golden margins ran up to £17 10s.; one pupa skin was sold for 6s., but another failed to find a buyer. Nice series of about fifty *Coenonympha typhon* (*davus*) made £2 2s. to £4; a lot of fifty *Erebia aethiops* (*blandina*), including two or three aberrational forms, 55s.; one of eighteen *Strymon pruni*, including a broadly-banded form, 42s.:

* Several cases are on record. See 'Proc. Ent. Soc. London.'—ED.

and an "hermaphrodite" *Bithys quercus* 30s. *Chrysophanus phlaeas* was well represented; silvery forms sold for 21s. to 88s. apiece, a pale golden for 84s., a lot of two bright golden for 70s., a remarkable form with a broad band of large blotches across centre of fore wings £9, and an "hermaphrodite" in a lot of twelve for 35s. the lot. A lot of three *Celastrina argiolus*, which included a very pale and a very dusky male, made 90s.; one of fifty-six *Plebeius aegon*, including a pale lilac male and other remarkable specimens, 55s.; a well-marked "hermaphrodite" £5 10s.; and a very pale, broadly-streaked underside of *Aricia medon* (*astrarche*) £9. There was one *Lampides baetica* in the collection, "taken near Dartford, by C. E. Sabine, 7 Sept., 1893," but even so the £9 paid for it seemed to be a good price. A smoky black male *Polyommatus icarus* sold for £9, a greenish-blue male 40s., one "left-side male, right-side female also 40s., a pale strongly-striped underside £7, and another, more strongly marked, with some other aberrations, £10 10s., while a nice series, including some well-marked Irish forms, made 55s. An asymmetrical *Agriades coridon*, in which the left fore wing was practically black, with narrow blue stripes, brought £5 10s., and a grey-brown radiated underside £9; a lot of eight v. *fowleri* £3 5s., and one containing two underside v. *obsoleta* and one radiated 50s. An ochreous-grey male *A. bellargus* and one black-dusted with broad margins in a lot of fourteen made £6 10s. the lot; four "black" forms sold separately at £8 10s. for the best, and 40s., 30s. and 16s. each for the others; and one of the most beautiful and perfect radiated male undersides we remember to have seen ran up to £20. There were three lots of twelve each of the "blues" taken by Sabine near Rainham in 1886 and said to be hybrids between *P. icarus* and *A. bellargus*, and they sold for £20, £5 and £3 per lot respectively. *Lycaena arion* in lots of about twenty made £4 per lot for those from Barnwell Wold and Gloucestershire, and from 35s. to 52s. 6d. for the Cornish, while an almost spotless specimen with an asymmetrical underside put up in one lot brought £8, and a beautiful dark aberration of *Carterocephalus palaemon* £5. The Heterocera were by comparison less interesting and had apparently not been so well kept up to date as the Rhopalocera, but there were many nice things among them and they found ready buyers. *Phryxus livornica* bred from larva taken at Ryde with its pupa skin made 20s., *Utetheisa pulchella* 30s., while couples of the same species in lots with other species brought 75s., 20s. and 16s. per lot. A black *Callimorpha dominula* sold for 55s., a nice light form of *Arctia caja* for £5 10s., and an almost unicolorous brown one for £5. *Laelia coenosa* was not in demand, the best two selling for 20s., four others for 18s., and five with four preserved larvæ for 14s. An "hermaphrodite" *Poecilocampa populi* made 20s., a smoky form of *Lasiocampa quercus* (with other species) £3, and a "hermaphrodite" *L. quercus* £6. Lots of six *Nola centonalis* with eight *N. albulalis* brought 25s. to 30s. per lot, a lot in which was included a fine black-streaked *Senta irrorella* 65s., and *Drepana harpagula* (*sicula*) in pairs 20s. and 35s. per pair. The one *Notodonta bicolor* in the collection ran up to £4 15s.; it was labelled "Burnt Wood, Staffs, Chapple." *Acronycta strigosa* sold at 25s., 45s. and 32s. 6d. per lot of ten, *Crymodes exulis* from Shetland at 18s., 18s., 45s. and 21s. per lot of

three, and from Rannoch at 65s. per lot of two for the two lots offered. A fine male *Hydrilla palustris*, of Farn's own taking, made 55s. *Noctua subrosea* ranged from 21s. to 63s. each, and *Cerastis erythrocephala* from 7s. to 12s. per couple, while an aberration of *Euclidia glyphica* having the outer third of its wings buff colour made £3 10s. *Catocala fraxini* in couples sold for 21s. and 28s., and *Dianthecia barettii* and *D. albimacula* put up in lots containing twelve of each species 32s. 6d. and 28s. per lot. *Xylina furcifera (conformis)* in lots of four made 32s. 6d. to 45s. per lot, a lot of six *X. conformis* and one *X. lambda (zinckenii)* 60s., and two other lots in each of which one *X. lambda* was included 80s. and 55s. respectively. A lot of sixty-four insects in which one each of *Thalpochares ostrina* and *T. parva* were included ran up to £4, while another lot which contained among its eighteen *Venilia macularia* one almost spotless and four heavily-blotched forms realised the like amount. Two *Boletobia fuliginaria* sold as one lot made 30s., and three *Cleora angularia (viduaria)* 60s. the lot. A sporting lot of six insects, viz. two *Aplasta ononaria*, three *Lythria purpuraria* and one Sp. ? sold for 42s., and another consisting of three *L. purpuraria* and three *Sterrha sacraria* 35s., while two lots of three *S. sacraria* each made 35s. and 37s. 6d. per lot respectively. The collection was not strong in remarkable forms of *Abraxas grossulariata*, and the highest price paid for any one lot of the species was 45s. for one of ten specimens. Long and varied series of *Melanippe montanata* made 50s., of *Cidaria truncata (russata)* 55s., and *C. immanata* 50s. and 40s., while two specimens of *C. prunata*, "suffused forms with cream bands," ran up to 70s. The "Micros" also sold fairly well, quite a number of lots realising between one and two pounds each. The cabinets that contained the collection were all well made and in thoroughly good condition, with drawers 20 x 18 inches, and the prices at which they sold were for those with 36 drawers £59 17s., £50, and £73 10s.; for the two 18-drawer pedestals £28 and £25 4s.; for the 12-drawer pedestal £14; and for a 20-drawer pedestal with 18 x 16-inch drawers £22. Among four lots of books that were included in the sale, one consisting of Newman's 'British Moths' interleaved with notes by Farn and 'Stainton's Manual' sold for 20s., and another of 14 parts of Mosley's 'Illustrations of Varieties of British Lepidoptera' £8. The total realised for the whole collection, cabinets and books was, in round figures, £2100.—R. A.

A NEW METHOD OF PRESERVING SPECIMENS.—We understand that "Thymo-Plas," a specially prepared plasticine compound for the preservation of specimens in small handy cells, has now been put on the market together with the necessary accessories by Messrs. Harbutt's Plasticine, Ltd. The method is the invention of Dr. Alfred Moore, and has been adopted by the Entomological Department of the Royal College of Science. It is claimed that by this method specimens can be kept in a fresh condition for very long periods.

'ZOOLOGICAL RECORD.'—Since 1914 the whole cost of printing and publishing this invaluable annual summary of zoological literature has been borne by the Zoological Society of London. Owing to the

present high prices of printing, etc., the sum which has to be found annually is now between £1500 and £2000, and it is very much feared that unless a more cordial support is forthcoming from zoological workers in general it may be necessary to cease publication in the near future. The annual subscription for the complete volume is £2 10s.; for the *Insecta* 15s. It is most earnestly to be hoped that the publication may not cease from lack of support on the part of entomologists.

WICKEN FEN FUND.—This fund is raised annually by entomologists to assist in defraying the expenses incurred by the Custodian of Wicken Fen, the National Trust, in administering and preserving the Fen, and in providing a watcher to protect the plants and wild life dwelling therein. Contributions are earnestly solicited; they should be sent to the Hon. Treasurer, W. G. Sheldon, Youlgreave, South Croydon.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 1st, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., etc., President, in the Chair.—The following were elected Fellows of the Society: Mrs. Margaret Rae, Courthill, Birkenhead; Dr. A. F. Rosa, M.D., 28, Pitt Street, Edinburgh; Mr. Frank Russell, F.G.S., Auldam House, Workop; and Capt. Francis Moysey, Suffolk Regiment, Talodi, Nuba Mountains, Sudan.—The Treasurer made a statement on the Wicken Fen Fund. He called attention to the valuable work that is being done on this Nature reserve and made an appeal for contributions towards its maintenance.—The Treasurer announced that the late Mr. G. A. J. Rothney had bequeathed the sum of £150 to the Society.—The President announced the death of Prof. Geldart, and a vote of condolence with his relatives was passed.—Dr. Waterston exhibited a Brazilian bee, *Melipona scutellaris*, Latr., taken near Brighton; also a stem of *Arundo phragmites* from which numerous pupæ of a Chalcid, *Geniocerus flavimanus*, Thom., were projecting.—Mr. H. Mace, a number of butterflies from the neighbourhood of Khartoum.—Mr. Adkin, *Diaphora mendica* var. *venosa*, Ad., from Co. Tyrone, and compared it with other races of the species.—Mr. E. B. Ashby, numerous insects of various orders from Piedmont, Italy.—Prof. E. B. Poulton reads some notes on the utilisation of derived plant pigments in the colouring of Lepidoptera; he also read a communication from the late Dr. T. A. Chapman on germinal "factors" and their independent existence and development.—Mr. Hugh Main read some notes on the metamorphoses of *Onthophagus laurus*, L., illustrated with some remarkable lantern-slides.—The following papers were read: "Gynandromorphous *Plebeius argus*, L.," by Dr. E. A. Cockayne; "Butterflies from the Nile," by Mr. H. Mace; "Types of Oriental Carabidæ in the Stettin Museum," by Mr. H. E. Andrewes; and "New Genera and Species of Neotropical Curculionidæ," by Dr. G. A. K. Marshall.—S. A. NEAVE, *Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*Annual Meeting, January 26th, 1922.*—Mr. Stanley Edwards, F.L.S., Vice-President,

in the Chair.—The Report of the Council, Statement of the Treasurer and Balance Sheet were received and adopted. The following members were declared elected Officers and Council for the ensuing year:—President: E. J. Bunnett, M.A., F.E.S. Vice-Presidents: K. G. Blair, B.Sc., F.E.S., and N. D. Riley, F.E.S., F.Z.S. Treasurer: A. E. Tonge, F.E.S. Librarian: A. W. Dods. Curator: S. R. Ashby, F.E.S. Assistant Curator: T. L. Barnett. Editor of Proceedings: Hy. J. Turner, F.E.S. Hon. Secretaries: Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S. Recorder: L. E. Dunster. Lanternist: A. W. Dennis. Council: T. L. Barnett, A. A. W. Buckstone, L. E. Dunster, O. R. Goodman, F.E.S., T. H. L. Grosvenor, F.E.S., H. A. Leeds, G. S. Robertson, M.D., E. Step, F.L.S., and S. Syms.—The President being unwell, his Annual Address was read by Mr. Riley. It was entitled "Will o' the Wisp," and dealt historically and biologically with fireflies.—The new President, Mr. E. J. Bunnett, then took the Chair, and votes of thanks were passed to the retiring Officers and Council. Major C. E. Lyles, 6, Hyde Park Mansions, and Mr. J. H. Adkin, Whitecliff Road, Purley, were elected members.—Mr. C. Craufurd exhibited an *Aglaia urticae* with a curious deficiency of colour in two streaks on the hind margin of the hind wings; the scaling was perfect.

February 9th.—The President in the Chair.—Miss Alice K. Lock, 77, Grove Hill Road, S.E., was elected a member.—Mr. R. Adkin exhibited a second brood series of *Brenthis selene* from Abbot's Wood, Sussex, at end of July and in August.—Mr. A. A. W. Buckstone, a large form of the same species racial in the Isle of Arran, and a series of a small race from Headly; and an aberrant form of *Taeniocampa incerta*, resembling both *T. munda* and *T. gracilis*.—Mr. H. W. Andrews, the Anthomyidae (Dip.), *Hylophila sponsa*, said to be rare, but common in Kent, and species of local *Limnophora*.—Mr. H. Moore, a large species of *Galeodes* from Cape Town, usually placed between the spiders and the mites; it attacks small birds, lizards, etc., and is venomous.—Mr. Blenkarn, *Cryptocephalus coryli* from Mickleham, with a spot on each elytra, and the racial form of *Philodecta laticollis* from Killarney, December, 1921.—Mr. H. J. Turner, for Mr. Greer of Stewartstown, aberrations of butterflies, *Euchloë cardamines*, ♂ ab. *marginata*, ♂ orange streaked with black, ♂ small, ♀ large, ♀ ab. *radiata*, ♀ orange streaks on fore wing; *Melitaea aurinia*, ♀ dull and obscure; *Pararge megera*, ♂, apical blotch reduced to a dot, apical spot duplicated; *Polyommatus icarus*, ♂, faint red marginal spots on hind wing above and below, ab. *icarinus*, ♂ ♀ gynandromorph, ♀ with red spots in margin forming a band.—Mr. Frohawk, *Aglaia urticae*, suffused very considerably; *Pieris napi* ♂, asymmetrical central wing spot, R. almost missing, L. unusually large; *Argynnis paphia*, ♂, central markings much suffused; *Euchloë cardamines*, ♂ and ♀, with discal spots in hind wings; *P. brassicae*, a series of *nigronotata* with well-developed discal spot; also a fine pencil sketch of a hybrid pheasant and grouse.—Mr. Enefer, *Curcuta epithymum*, the dodder of the gorse, an anastomose specimen of oak, and a section of the mistletoe on apple.—H. J. TURNER, *Hon. Sec.*

LONDON NATURAL HISTORY SOCIETY.—November 22nd, 1921.—Among the entomological exhibits were seven specimens of *Grapta c-album* bred from pupæ found in September in Herefordshire, showing both “marbled” and “non-marbled” forms, exhibited by Mr. Robbins, and some *Eu Vanessa antiopa* with white borders caught in August and September in fresh condition by Dr. Cockayne. The paper read was on “Bird Protection,” by Mr. Masefield.

January 3rd, 1922.—Mr. Mera exhibited *Ephyra linearia*, first and second broods, and Mr. Burkill, galls of *Cryptocampus medullarius* on *Salix pentandra*. Papers read dealt with the season of 1921, Mr. L. W. Newman giving a comprehensive survey of his experiences with Lepidoptera during the long drought.

February 7th.—Among the exhibits were a series of gynandromorphs of *Plebeius argus* (Dr. Cockayne), varieties of *Abraxas grossulariata* bred in London (Mr. Riches), *Dryas paphia* (Mr. H. B. Williams), *Hemerophila abruptaria* (Mr. W. A. Southey), *Erebia blandina*, *Chrysophanus phloeas*, *Brephos parthenias* and *Pseudoterpna pruinata* and their varieties (Mr. Worsley Wood), and mounted specimens of plant galls (Messrs. Hall and Burkill). Mr. O. G. Pike exhibited a series of coloured slides of birds.

February 21st.—Paper read, “British Ferns,” by Mr. Robbins.

March 7th.—Exhibits: Burrow of *Sesia andrenæformis*, and galls of *Eriophyes ilicis*, etc. Paper read, “The Buried Palace at Knossos,” by Rev. H. J. Gamble, M.A.—H. J. BURKILL, *Minuting Secretary*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held on March 1st, 1922, at the Manchester Museum, Mr. H. Britten, F.E.S., President, in the Chair. Messrs. Daniel Lea, 27, Bridge Street, Manchester, E. P. Collett, 8, St. John Street, Manchester, were elected members of the Society.—The President read a letter announcing the death of Mr. Kenneth Rhodes at Oxford on February 16th, 1922, and a vote of condolence was passed to his relatives.—Exhibits: Mr. W. Buckley, for Mr. W. Mansbridge, several fine photographs illustrating the resting habits of Lepidoptera, taken by Mr. H. Main.—Mr. H. Halkyard, a storebox of Hymenoptera collected during 1921 from Broadbottom, Cheshire, and ♀♀ and ♂♂ of the ant *Tetramorium guineense* from same locality.—Mr. B. H. Crabtree, several fine varieties of *Vanessa urticae*.—Mr. G. Wynne, *Ennychia octomaculata* from Macclesfield, new to the Cheshire list. Lepidoptera from St. Anne's-on-Sea, Lancashire, 1921: *Luperina gueneei*, *Agrotis praecox*, *A. ripae*, *Leucania littoralis*, *Eupithecia succenturiata*, *E. oblongata*, *Nyssia zonaria*, *Dasychira fascelina*, *Pararge megaera*, *Satyrus semele*. The meeting then adjourned to an open lecture given by Mr. H. Britten, F.E.S., on “Protective Coloration in Insects,” illustrated by some fine lantern-slides showing the resting habits and protective coloration of insects, mostly Lepidoptera, and a few birds. Most of the slides were photographed by the lecturer himself.—J. F. G. WYNNE, *Hon. Recording Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, January 16th, 1922.—Mr. J. W. Griffin, F.E.S., in the Chair.—Mr. H. O. Wells,

"Inchiquin," Lynwood Avenue, Epsom, was elected a member of the Society.—Mr. Wm. Mansbridge reported favourable progress of the Joint Committee of Scientific Societies in Liverpool towards arranging an Associated Soiree, and the general closer co-operation of the scientific societies in the district.—Mr. Mansbridge then read his report as Recorder of Lepidoptera for the years 1920 and 1921. He mentioned that, besides many interesting records, five species had been added to the Lancashire and Cheshire list in 1920 and five in 1921. These included one species new to Britain, viz. *Blastobasis lignea*, Wlsm., and its variety *adustella*, Wlsm. Most of the additions had been made by the members who study Micro-lepidoptera, and this was considered to be a very encouraging feature of the Society's work.—Mr. H. B. Prince exhibited a box of insects which he had bred from a number of larvæ caught in paper traps at Hightown; they included *A. triangulum*, *A. ditrapezium*, *P. fuliginosa*, *L. lithargyrea*, *T. gothica*, *T. baja* and *A. comes*. This is the first record of *ditrapezium* in Lancashire.—CHARLES P. RIMMER, *Hon. Sec.*

CARLISLE NATURAL HISTORY SOCIETY.—November 17th, 1921.—Mr. G. B. Routledge showed a specimen of the ground beetle *Pterostichus vulgaris* from which a long intestinal worm was protruding.—Rev. H. D. Ford, a pale example of *Brenthis selene*, a curiously bleached *Coenonympha typhon*, a dwarf *Zephyrus quercus*, *Erebia epiphron* with white pupillation, *Agrotis exclamatoris* with enlarged markings and *Selenia bilunaria* with the left hind wing missing.—Mr. F. H. Day, a dwarf ♂ *Pararge megaera* from Cummersdale, *Porthesia similis* from Drigg and not taken in Cumberland for a very long time, *Epinephele tithonus* from South Cumberland, where it had been very common last July; in the north of the county it was unknown. Some discussion took place on the early appearance of butterflies in 1921, most of the species having been two to three weeks before their usual time; thus *Callophrys rubi* had been "out" at the end of April, *Euchloë cardamines* and *Pararge megaera* early in May, *Coenonympha typhon* on June 4th and *Argynnis aglaia* on June 18th.—Mr. Murray, *Hemiptera* taken locally, including *Strongylocoris luridus*, the first to be taken in Cumberland and extremely rare in Britain, *Bothynotus pilosus* and *Ploiariola culiciformis*.

December 1st.—Dr. Day showed a long variable series of *Satyrus semele* from the Cumberland coast where it had been commoner than usual in 1921, also vars. of *Chrysophanus phlaeas* from the second brood which were remarkably dull in colour.

January 5th, 1922.—The extreme abundance of *Pyrameis atalanta* in 1921 was discussed, the general view being that it had never been observed in such large numbers in the district before. *P. cardui* had been fairly well represented. Among a number of *P. atalanta* exhibited was one with the left primary aborted, the colours pale, the scarlet band broken, but entire on the right side.—Mr. Murray, the large Dipteron *Tabanus sudeticus*, and it was remarked that the allied *T. bovinus* had not been taken in Cumberland.

February 2nd.—Mr. Day showed about 70 specimens of *Bombus* and *Psithyrus* taken in Cumberland last season, and said that

14 species of the former genus and 4 of the latter had now been captured in the county.—Mr. Murray, a box of Cayenne pepper in which the beetle *Anobium paniceum* was breeding.

March 3rd.—An exhibit of locally-taken forms of the common froghopper *Philaenus spumarius* was made by Messrs. Murray and Day, the following being represented: *lateralis*, L., *populi*, F., *lineata*, F., *vittata*, F., *leucophthalma*, L., *leucocephala*, L., and *marginellus*, F. Mr. Day showed the following Coleoptera which had not occurred in Cumberland before: *Meligethes exilis* from Drigg, *Pityogenes chalcographus*, *Dryocaetes autographus* and *Tomicus typographus*, the three latter taken under bark of spruce in Carlisle.—F. H. DAY, Hon. Sec.

OBITUARY.

GILBERT STOREY was already a keen naturalist when at school at King William's College, Isle of Man. He went to Queens' College, Cambridge, in 1909, and there spent much of his spare time collecting Lepidoptera in the neighbouring fens.

On leaving Cambridge in 1912 he obtained a temporary appointment in the Imperial Bureau of Entomology, but three months later he went out to join the Entomological Section of the Ministry of Agriculture of Egypt. His work there was largely administrative, but he was closely associated with Dr. L. D. Gough in the development of the seed-heating method of destroying the Pink Boll-worm of cotton. Later he was appointed Sub-Director of the Entomological Section.

In 1920 his exceptional abilities caused him to be offered the post of Technical Secretary to the Cotton Research Board—a recently formed organisation for research on problems of cotton cultivation in Egypt. After piloting through the press the first annual report of this Board, he was engaged on the second report when he was taken ill, but finished the report in bed a few days before his death on April 5th, 1922.

In addition to being an excellent entomologist, he was a first-class athlete, and possessed a fluent knowledge of Arabic.


His death at the early age of thirty-one is mourned in Egypt by Europeans and Egyptians alike.

C. B. W.

WE deeply regret to hear of the death of Mr. Arthur Bacot at Cairo on Wednesday, April 12th, from typhus.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

 NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—Early stages of Progemmaria, Flavicornis, Cruda, Munda, Instabilis, Rubricosa, Rupicaprararia and many others. *Imagines.*—Most Taniocampids. *Wanted.*—Very numerous, all stages; also Micros.—*Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.*

Duplicate.—Vol. IV of Tutt's 'British Butterflies,' new condition, original cloth. *Wanted.*—A copy of Vol. III. Correspondence invited.—*C. M. Woodford, The Grinstead, Partridge Green, Sussex.*

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, May 3rd, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, May 11th, at 7 p.m., Ordinary Meeting. Saturday, May 20th, Field Meeting at Rammore Common. Thursday, May 25th, at 7 p.m., Ordinary Meeting. Paper, "The Lepidopterous Enemies of Man, with Special Reference to the British Species."*—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, **9/9**; 2,000, **12/9**; 3,000, **15/9**.

Locality and date only (2 lines): 1,000 labels, **9/-**; 2,000, **12/-**; 3,000, **15/-**.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type** made ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, **12/-**; 2,000, **15/-**; 3,000, **18/-**.

Locality and date only (2 lines): 1,000 labels, **10/6**; 2,000, **13/6**; 3,000, **16/6**.

Unequal quantities of localities, etc., or each additional line, in either style of type, **1 6 extra**. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations () () () () 100, **1 6**; 300, **3/-**.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

CONTENTS.

The Life-history of *Hemerobius stigma*, Steph., *C. L. Withycombe, B.Sc., F.E.S.*, 97. Notes on *Colias croceus*, Fourc. (*Edusa*, F.) in Mesopotamia and North-West Persia, 1918-1921, *Lt.-Col. H. D. Peile, I.M.S.*, 100. Trichoptera in Dorset, *F. H. Haines, M.R.C.S., L.R.C.P.*, 104. A Synopsis of British Proctotrypidæ (*Oxyura*), *Claude Morley, F.E.S., F.Z.S., etc. (continued from p. 83)*, 108.

NOTES AND OBSERVATIONS.—*Vanessa antiopa* in Gloucestershire, *Geo. C. Griffiths*, 111. *H. micacea f. brunnea* at Seaford, *B. H. Armstrong*, 111. Unusual Occurrence of *Pieris rapæ*, *Stanley A. Blenkarn*, 111. Early Occurrence of *S. populi*, etc., *Guy Stanton*, 111. *Lycæna astrarche* vars. in North Lancashire, *Albert E. Wright*, 111. *Acrobasis tumidana*, Schiff = *verrucella*, Hb., = *rubrotibiella*, F.R., at Darenth, *W. G. Sheldon*, 112. Butterflies attracted by Human Perspiration, *G. F. Mathew*, 112. The Farn Collection: Second and Third Days' Sale, *R. A.*, 113. A New Method of Preserving Specimens, 115. 'Zoological Record,' 116. Wicken Fen Fund, 116.

SOCIETIES.—The Entomological Society of London, 116. The South London Entomological Society, 116. London Natural History Society, 118. Manchester Entomological Society, 118. Lancashire and Cheshire Entomological Society, 118. Carlisle Natural History Society, 119.

OBITUARY, 120.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 18s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By *RICHARD SOUTH, F.E.S.* Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

Vol. LV.]

JUNE, 1922.

[No. 709.

THE
ENTOMOLOGIST

Illustrated Monthly Journal

OF ENTOMOLOGY

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

Dr D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock-

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of

British, Continental & Exotic Lepidoptera

and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

BIG BARGAIN IN SOUTH AMERICAN BUTTERFLIES.

Have just received a lot of Brilliant Tropical Butterflies that I can offer at £1 16s. per 100. Includes Papilio, Catagramma, Perisame, Batesea, Catopsilia, Heliconidæ, etc., not all perfect, but in good condition. Lyc. exilis at 18s. per 100. I also have Morpho rhetenor, sulkowski, cypris, menelaus, amathonte, etc., and a few ♀ ♀ of same. Send for Price List.

*Dealers or Collectors of Butterflies in India, Java, Oceania, etc.,
please send list of showy butterflies.*

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.





H. ROWLAND-BROWN.

THE ENTOMOLOGIST.

Vol. LV.]

JUNE, 1922.

[No. 709

HENRY ROWLAND-BROWN.

(Plate I.)*

It is with the deepest regret that we have to record the death of one of the best known and most popular of British entomologists, a member of our Editorial Staff, and one whose writings are known and appreciated by all our readers.

Although past his first youth Mr. Rowland-Brown was of such strong physique, and had enjoyed such perfect health until recently, that so far as could be seen there were many years of life before him. About a year ago, however, he developed a heart affection, which it is thought originated early in life through athleticism, and which there is not much doubt was hastened by his strenuous war work. Although apparently hopelessly ill last summer, his splendid constitution enabled him to make a wonderful rally, and it was hoped he might be restored to partial health and comfort, but it was not to be, and he passed away at his residence, Oxhey Grove, Harrow Weald, on May 3rd last.

Henry Rowland-Brown was born at Woodridings, Pinner, on May 19th, 1865, and would thus be in his fifty-seventh year at the time of his death. He was educated at Rugby, being during a portion of his schooldays under the care of the well-known hymenopterist, the Rev. F. D. Morice. At school he was a noted athlete, and winner of the record quarter-mile. After leaving Rugby he proceeded to Oxford (University College), where he took his degree of Master of Arts. After leaving Oxford, he, a member of an old legal family, studied for the Bar, to which he was called in due course.

He was a man of many parts: journalism and other literary pursuits occupied much of his working time, and he frequently contributed to the *Times*, and to the 'Strand,' 'Cornhill,' and other magazines. But he was also a poet of no mean powers, and his two volumes, 'Rhymes and Rhapsodies' and 'Preludes and Symphonies,' betray true poetic genius. He usually wrote under the *nom-de-plume* of "Oliver Grey," a name associated with that of his sister, Miss Rowland-Brown, the novelist, whose name and writings as "Rowland Grey" have attained world-wide fame.

Amongst his troops of friends he numbered as intimate ones

* We are greatly indebted to M. Charles Oberthür for his express permission to reproduce this photograph from his 'Lépidoptérologie Comparée.'—Ed.

Sir William Gilbert (of Gilbert and Sullivan Opera fame), and M. Charles Oberthür, the greatest of French entomologists. During the war, as he was too old to join up, he gave voluntary assistance for a time as secretary to the Royal Patriotic Fund. Later he was appointed a Commissioner for Civil Liabilities, holding the largest single-handed district, Wandsworth and Battersea; as before intimated, this work, which was very arduous, overtaxed his constitution, and hastened his end.

Rowland-Brown was a Nature-lover and entomologist from his childhood; his great love was the Rhopalocera. The writer, who knew him intimately for many years, recollects the joy with which he spoke of chasing *Colias edusa* with his sister when they were young children. One of his last letters (dictated) to the Editor of this magazine recounts that he commenced to take it in when he was twelve years of age, and that he had continued to do so ever since. The last book he read was the 'Entomologist.' Readers will not need to be told that for years he has been its most prolific contributor, and that much of his most important work, with accounts of the many excursions he made in search of butterflies to various parts of Continental Europe, are to be found in its pages. His special study was the *Diurni* of France, with which he undoubtedly possessed a greater acquaintance than any other Englishman. He intended at one time to bring out a book on this subject, but the war put an end to the project, as well as to a revised edition of Kane's classic, 'European Butterflies,' at a period when they were well advanced. A number of his papers are included in M. Oberthür's beautiful publications, including 'Nature Study and the War,' which had appeared previously in the *Times*, and a monograph on the British races of *Coenonympha tiphon*. The latter paper, beautifully illustrated by Culot, and by a series of photographs, was thoroughly worked out, and is, in the opinion of the writer, one of the best papers on any British Lepidopteron. His last contribution to entomology, which appeared in this magazine, was a very exhaustive one on the forms of a very favourite species—*Colias croceus* (*edusa*).

The subject of this notice was essentially a lover of all Nature, and especially of what he used to style his "beloved butterflies." The writer's last visit was paid to him in October last; he had been able to get down to the library, amongst his cabinets, after months of pain and sickness. It was touching to see the glee with which he showed and discussed certain of his treasures.

It is understood that his collections, including those of the Rev. F. E. Lowe, recently bequeathed to him, and his entomological library will be given at his request to the London Entomological Society with remainder to the Hope Museum, Oxford. The latter has previously received a fine microscope left him by Sir W. S. Gilbert.

Rowland-Brown was one of the best-known Fellows of the Entomological Society, which he joined in 1887, and one of its most helpful friends. He was a regular attendant at its meetings. Beyond everything else he rendered it great service as Honorary Secretary from 1900 to 1910, and again in 1921, when the health of the Rev. G. Wheeler would not permit him to continue his duties, they were resumed by him. He was one of the best and most popular secretaries the Society ever had, was nominated a Vice-President in 1908 and 1910, and elected on the Council in 1914-16 and again in 1922. The writer remembers, too, the valuable assistance rendered by an excellent review of, and appeal for, the Society's Housing Fund, which appeared in this magazine early in 1921.

Before the war, when the Entomological Club, of which he was a member, was in full activity, his share of its hospitalities was delightfully dispensed at the Savage Club, and the writer remembers happy hours passed under those auspices; he was an excellent *raconteur*, and a most charming host, both there and at his own home.

He was laid at rest in the cemetery adjoining the old church at Pinner, amongst his happy hunting-grounds. Nature welcomed the return of her lover to her breast: the sun shone brightly; the warm southern wind blew softly; plant and shrub and tree were breaking into leaf, and the birds mingled their notes with the melody of the organ and the voices of the choristers. He will sleep soundly after long suffering, patiently and bravely borne. To his bereaved mother and sister we desire to tender our very deep and sincere sympathy.—W. G. S.

TWO NEW SPECIES OF FAR EASTERN RHOPALOCERA.

BY WARO NAKAHARA, A.M., PH.D.

Eurema dorothea, n. sp. (Pieridae).

Male.—Wings bright lemon yellow, sprinkled with black atoms in the basal one-third. Fore wing with straight outer margin, not angulated at apex; the black border broadest at apex, slightly narrower toward hind angle, and very narrow along costa; the inner portion of the black border evenly undulated, showing no marked indentation at the third and fourth interspaces as in *E. hecabe*, Bois., *E. latimargo*, Hoff., *E. andersoni*, Moore, etc.; the black border of hind wing nearly as broad as in *E. latimargo*, Hoff. Marginal fringes blackish in fore wing, yellow in hind wing. Underside: both wings with minute black dots along the margin and two dots near the end of discal cell; hind wing irregularly and slightly sprinkled with dark atoms. Head and thorax black above, pale yellow beneath; palpus yellow, with a delicate dorsal black streak; abdomen yellowish, with an intact dorsal, and broken lateral black stripes.

Length of body $\frac{5}{8}$ in.; expanse of wings $1\frac{3}{4}$ in.

Holotype: ♂, Horisha, Formosa, July 20th, 1919 (K. Asakura). Type in the collection of the author.

Very close to *E. libythea*, Fab., but far larger in size, and lacks the orange border to the fore wing underside.

Zizera sylvia, n. sp. (Lycænidae).

Male.—Wings, upperside, violet-blue, darker and less purplish than in *maha*; costal margin of fore wing without whitish scales, outer margin broadly bordered with black, with a trace of a short whitish streak at hind angle. Hind wing similarly marked, but the black border narrower, and with a row of four or five obscure black spots along outer margin. Fringes white. Underside grey, not buffish as in *maha*; fore wing with three rows of black spots along outer margin; internal row consists of five round spots, each encircled with white, and a less distinct bar at the bottom of the row; median (submarginal) row with six very much larger spots; external (marginal) row rudimental, disappearing toward hind angle; a prominent black bar at the end of discal cell; no black spots in the middle of discal cell, or near the base of the wing. Hind wing with five series of black spots; basal series with two or often three spots; costo-discal series three spots, including the bar at the end of discal cell; limbal series with six spots, extending from the first to sixth interspaces; submarginal series most conspicuous, consisting of eight very heavy spots; marginal series indistinct, often hardly recognisable; all the spots more or less distinctly encircled with white. Fringes white, regularly interrupted by grey.

Female.—Wings; upperside fuscous black with a trace of blue near the base; underside same as in the male.

Length of body $\frac{1}{3}$ to $\frac{3}{8}$ in.; expanse of wings $\frac{7}{8}$ to $\frac{1\frac{5}{8}}{16}$ in.

Holotype: ♂, Kusakimura, Province of Harima, Japan, July 7th, 1920 (S. Iguchi). Allotopotype: ♀. Paratopotype: 2 ♂s and ♀. Types in the collection of the author.

Resembles the summer brood of *Z. maha*, Koll., but smaller, and has narrower wings. It can be most readily told from *maha* by the markings on the hind wing underside. In *maha* the black spot in the seventh interspace is so situated as to connect the spot in the eighth interspace to the limbal series (as in most *Lycaenas*), whereas in *sylvia* the corresponding spot is located right behind the spot of the eighth interspace, separating that spot from the limbal series (as in *Cyaniris argiolus*, L., etc.). In this respect this species is more like *Z. labradus*, Godt., from which, as well as from *maha*, differing conspicuously by the submarginal series of black spots on the underside being much heavier than the marginal series.

11, West Sixty-Eighth Street,
New York City;

February 5th, 1922.

NOTES ON BRITISH ODONATA IN 1921.

BY W. J. LUCAS, B.A., F.E.S.

My first dragonfly experience for 1921 was the receipt of a very teneral male *Pyrrhosoma nymphula*, Sulz., from G. T. Lyle, which he captured on 1 May at Wicken Fen. I did not myself meet with a dragonfly till 16 May, when *Ischnura elegans*, Vanderl., was found in large numbers—many mature, a smaller number teneral—along a ditch or drain at Lodmoor, Weymouth.

On 18 May I took in the New Forest a male *P. nymphula*, fairly mature but still with the thoracic markings yellow instead of crimson. The next day, in addition, I met with *Calopteryx virgo*, Linn., *Libellula depressa*, Linn., and *Gomphus vulgatissimus*, Linn., most, if not all, of which appeared to be teneral. On the 20th *Libellula quadrimaculata*, Linn., was captured in somewhat teneral condition and *Orthetrum caerulescens*, Fabr., decidedly in that state; *Agrion puella*, Linn., male, was, however, taken mature, and *P. nymphula*, which was by then common, was secured with crimson thoracic markings for the first time. On 21 May *Cordulegaster annulatus*, Latr., was met with, and by this time the dragonfly season may be said to have been in full swing.

Æschnidæ.

Gomphus vulgatissimus, Linn. Besides the one seen on 19 May, a pair were taken *in copula* on 7 June near Oberwater in the New Forest, and the species was seen again in the same locality on 9 June.

Cordulegaster annulatus, Latr., was first met with in the New Forest on 21 May, and last noticed in the same place between 31 Aug. and 20 Sept., when dragonflies, no doubt owing to the drought, were no longer common in the Forest.

Brachytron pratense, Müll. On 6 June two males were taken at Marlborough Deepes in the New Forest.

Aeschna grandis, Linn., was seen ovipositing in the Long Water at Hampton Court, Middlesex, on 19 August. At the Hut Ponds near Wisley, Surrey, it was seen on 22 Aug.

Ae. cyanea, Müll. On 5 Sept. a male was caught near Avonwater in the New Forest. While held by its wings a fly was offered it about the size of a house-fly—one of those that follow one so persistently in the summer. This it took readily and ate; but a second that was offered was refused. While its wings were held it was still able to set up vibrations in some way. Its head and surrounding parts were seen to be in motion, so it seemed clear that these vibrations were not due to movements originating in the wings. The last dragonfly seen during the season was an *Aeschna* (probably of this species), flying about a Scotch Fir at Oxshott Heath, Surrey, on 29 October.

Anax imperator, Leach. Several were noticed on 14 June at the Black Pond, Esher Common, Surrey, although dragonflies did not seem to be very numerous in the neighbourhood.

Libellulidæ.

Cordulia aenea, Linn. One male was taken at Marlborough Deep in the New Forest on 6 June, perhaps the only specimen seen. This capture is an interesting one, since the species is but little known and apparently quite uncommon in the Forest.

Libellula quadrimaculata, Linn., was fairly common on the same date and at the same place as the last.

Orthetrum caerulescens, Fabr. On 3 June there appeared to have recently been a great "hatch" of this species, for they were plentiful on that date in the Forest, though still teneral; but by 9 June some were acquiring a blue tint. This species seems to take some time to develop the cerulean bloom.

Sympetrum striolatum, Charp., appeared to be less common than usual, possibly in consequence of the drought. On 9 Oct., a warm day, considerable numbers of *Sympettra*, no doubt all *S. striolatum*, were flying, some connected *per collum* and the female ovipositing, at the large pond on Epsom Common, Surrey. All the examples captured were of this species.

Sympetrum sanguineum, Müll. A female was taken at the Hut Ponds near Wisley, Surrey on 22nd August, and possibly the species was seen there as late as 25 Oct.

Sympetrum scoticum, Don., was noticed at the ponds just mentioned on 22 August.

Calopterygidæ.

Calopteryx virgo, Linn. After being first met with in the New Forest on 19 May, it was found to be common on the 22nd, though few comparatively had attained a blue tint to the wings; the same thing was noticed the next day. By 8 June, however, the wings were commonly blue and the insects made a fine show as they flitted about in the sunshine. On 22 July they were passing, only occasional specimens being seen. They disappeared earlier than usual, as was perhaps to be expected.

Lestidæ.

Lestes sponsa, Hans. This dragonfly was noticed but once—at the Hut Ponds on 22 August. It is really one of our common dragonflies, but the naiad seems to be rather elusive, and the writer would be glad to receive some, or their empty skins.

Agrionidæ.

Platynemis pennipes, Pall., was first seen on 4 June, in the New Forest, and the specimen happened to be the var. *lactea*, Charp.

Ischnura elegans, Vanderl., was not sought for. After finding

it on 16 May at Weymouth, I took a teneral example in the New Forest on 9 June, and noticed it again on 22 Aug., at the Hut Ponds.

Ischnura pumilio, Charp. I searched several times and at various places in the New Forest for this little dragonfly, but again failed to find it. It is to be feared that for some reason it has disappeared, at any rate for the time being. It probably lives in bogs, rather than in more open waters, and should be looked for in such places.

Agrion mercuriale, Charp. On 25 May two females were secured at Duck Hole Bog in the New Forest, and perhaps a male was seen, but a male was not captured till 3 June.

Agrion puella, Linn., was first taken on 20 May in the New Forest; it was common on 6 June at Marlborough Deep. On 18 July I took a male at Blackwater in the New Forest with a black dot within the U-spot on the 2nd segment of the abdomen; but aberrant black markings are not uncommon on the blue Agrions.

Pyrrosoma nymphula, Sulz. This common dragonfly was not much noted after the middle of May. It was common at Marlborough Deep on 6 June.

Pyrrosoma tenellum, Vill., was first seen in the New Forest on 3 June, when it seemed to be out plentifully. A female of the var. *melanogastrum*, Selys, was captured.

Enallagma cyathigerum, Charp. This very common little Agrionid was not particularly looked for. It was, however, taken on 1 July at two interesting localities in Middlesex—Stanmore Common and Elstree Reservoir. One specimen from the latter locality had on the 2nd segment a very goblet-shaped spot with but slight attachment to the circlet, while one from the former place had the spot quite detached. The species was met with commonly at the Hut Ponds on 22 August.

(To be continued.)

RAMBLES IN SOUTH-EASTERN FRANCE.

By F. A. OLDAKER, M.A., F.E.S.

The walking tour that I had planned for August, 1914, but which was rendered abortive by the outbreak of the Great War, was carried out by my son and myself in a somewhat extended form during August, 1920, and with other members of my family I paid another visit to the same district in August, 1921. Though entomology was not, I fear, the only object of interest to us on either occasion, we used our nets in every suitable place *en route*, and the list of captures appended will show that our efforts were not altogether unproductive.

Arrived at Avignon on August 1st, a walk outside the walls by the river gave us some much-needed coolness, and we saw

several butterflies, including a fine male *Apatura iris* and a large number of *Colias edusa* flying very fast. In the evening we went on to Arles, and the next day we saw *Colias edusa* and many other insects, including *Pontia daplidice*. About three in the afternoon we started on our first tramp, from Arles to St. Gilles. The road was dusty and the heat great, but we caught a few butterflies, and found very comfortable quarters at the Hôtel du Globe. Early the following morning we were on the road again with Nîmes as our objective, and a clearing by the railway, with a marsh and small copse alongside, yielded our first really interesting bag. From Nîmes we took the train to Narbonne, where serious business began. It was showery on the morning of August 4th, and an occasional thunderstorm led us more than once to take what shelter we could find. Passing through Sigean, we made our way to La Nouvelle. On August 5th we had what was probably our most uninteresting walk, but it was relieved by the capture of two full-fed larvæ of *Saturnia pavonia-major*, which were walking over the dusty road, and which spun up the next day. (A fine female emerged from one of these on May 21st, 1921.)* We also took a very large female *Papilio podalirius* ab. *feisthamelii* in perfect condition, and saw some small larvæ of *Papilio machaon*. Hot and dusty we reached Perpignan about seven, but soon recovered after the excellent dinner provided at the Hôtel de la Loge. On the following day we took the train to Argeles-sur-Mer, and walked along the coast through Collioure, Port Vendres, Banyuls-sur-Mer and back again—a delightful walk with grand views of mountain and sea. A few butterflies, chiefly Argynnis and Melitæas, were taken on this day, and many *Macroglossa stellatarum* and *Callimorpha hera* were seen among the rocks in the brilliant sunlight. On August 7th we began our tramp at Le Boulou, and walked along the valley of the Tech, over the Pont de Ceret, through Palalda and Amélie-les-Bains to Arles-sur-Tech, where we were fortunate in getting the last available room in the Hôtel Glycines. On this road we took our first specimens of *Gonepteryx cleopatra* (which here as elsewhere we always saw flying in company with *Gonepteryx rhamni*), *Leptosia sinapis* and *Issoria luthonia*; we also saw *Charaxes jasius* flying high among the tree-tops, but we could not entice him into our nets. *Papilio podalirius* ab. *feisthamelii* and *Papilio machaon* were in profusion, but mostly in rags. Though we were up betimes on August 8th our start was delayed, because we could get no breakfast till the kitchen fire was lighted (and they seemed disinclined to hurry the process). However, we were off before the heat of the day, and began a long and arduous climb through Corsavy up to the Col de la Cirère. When we were within a short distance of the iron mine at Batère we were overtaken by a severe storm of thunder and

* The other, also a female, emerged May 21st, 1922.—F. A. O.

hail, and we considered it prudent to make a halt at the cantine, where eventually we stayed the night. The people were most friendly, and the proprietor of the cantine rose to the unusual occasion in fine style. Next morning we did not go over the Canigou, but skirted round it to Valmanya. The views all round us were magnificent, and we took a large number of butterflies, including *Erebia tyndarus* var. *rondoui* and *Erebia neoridas*. In places the going was bad, owing to the uncertainty of the track and the loose stones, and so we could not pursue what we took to be a *Parnassius* some distance above our path—the only *Parnassius* we encountered during the whole trip. We had a long rest and some extremely refreshing beer at the Café du Canigou at Valmanya, prior to our 16 kilometre tramp to Vinca, through a magnificent winding gorge, with a thunder-storm passing behind but not overtaking us. At Vinca we struck what was perhaps the least comfortable hotel of the trip, but even here the food was good. On August 10th we walked to Vernet, and as the day was overcast we caught little. On the following day we tramped through Olette and Fontpédrouse to Mont Louis—a grand walk, with rushing torrents far below us and little streamlets leaping down the mountain sides. On August 12th we had another glorious walk through Saillagouse to Bourg Madame, where we arrived in a deluge. But we were soon comfortably installed in the Hôtel Salvat, and towards dinner-time it cleared. On the following morning we started early for a longish tramp over the Col de Puymorens to l'Hospitalet. The views into Spain are grand, and the short cut across the rough ground from the Col down to l'Hospitalet saved us a good many kilometres. We got some good butterflies on this day, and just before reaching the Col we saw our first *Euvanessa antiopa*. On August 14th we walked through intermittent showers to Ax-les-Thermes.

On the 15th we woke to find it raining in torrents, and it looked like continuing to do so for the rest of time. But it had cleared a little by ten o'clock, so we started off, prepared for a wettish walk over the Col de Chioula and the Col de Marmare to Belcaire. All the valleys on the way up were obscured by mist, so we did not see much.

On the following day—August 16th—after passing through Espezel and down many zigzags, we came upon such a profusion of butterflies as I had never before seen: *Gonepteryx cleopatra*, *G. rhamni*, *Limenitis camilla*, many Vanessids and Argynnids, and countless swarms of *Leptosia sinapis*, *Colias edusa* and *C. hyale*, *Papilio machaon* and *P. podalirius* ab. *feisthamelii*, Browns and Blues, *Satyrus hermione* on the tree-trunks, etc. The Blues and Whites were mostly in large bunches on the road wherever there was a damp patch, and they rose in clouds as one got close to them. This profusion lasted all along through Belfort,

Joucou and Marsa, and as the road was on a gentle decline through the truly magnificent Gorge of the Rebenty, this day stands out in the memory. (In 1921 we revisited this same gorge, but it was a dull day and we took next to nothing.)

The next morning (August 17th) we walked south from Axat for a few kilometres through the Gorge of St. George, and were rewarded at its further end by another prolific bag in a small clearing by the riverside. Most of the species we had met with on the previous day were again taken here, as well as some nicely marked *Melitaea phoebe* and some large *Agriades corydon*. After spending a couple of hours on this delightful spot we returned to Axat, and went on to Quillan through another fine gorge (Pierre Lys), in which we saw a few butterflies and found a full-fed larva of *Papilio machaon*, which duly produced an imago on June 8th, 1921.

This practically finished the entomological part of our trip in 1920, for on the following days we walked along the valley of the Aude through Esperaza Couiza and Alet to Limoux, and thence to Carcassonne, where our interests were other than entomological, though we saw many Whites in the Hautes Lices within the city walls.

In 1921 we reversed the order of our trip. Starting at Carcassonne on August 6th, in the scorching sunshine, we went on to Quillan, where we spent three weeks.

On August 25th we left Quillan for Perpignan, and from Perpignan we went to Banyuls-sur-Mer. On September 2nd we returned to Paris.

Mr. Rowland-Brown and Mr. Bethune-Baker have very kindly looked through my captures, so the following list can be relied upon:

HESPERIIDÆ.—*Carcharodus lavateræ*, *C. althææ*, *C. alcaæ*, *Hesperia fritillum* (= *cirsii*), *H. alreus*, *H. onopordi*, *Pyrgus sao*, *Nisoniades tages*, *Pamphila sylvanus*, *Thymelicus actæon* (very worn), *T. flavus* (= *thauamas*).

LYCÆNIDÆ.—*Chrysophanus dorilis*, *Rumicia phlaeas*, *Nomiades semiargus*, *Everes argiades* ab. *coretas*, *Agriades corydon*, *A. bellargus*, *Lycaena baton*, *Polyommatus escheri* var. *rondoni*, *P. icarus* (several of the *arcuata* form) and ab. *icarinus*, *Aricia medon*, *Plebeius argus*, *Lampides boeticus*.

ERYCINIDÆ.—*Nemeobius lucina*.

PAPILIONIDÆ.—*Papilio podalirius* ab. *feisthamelii*, *P. machaon*, *Parnassius apollo*? (seen only).

PIERIDÆ.—*Pieris brassicae*, *P. rapæ*, *P. manni*, *f. rossi*, *Pontia daplidice*, *Leptosia sinapis*, *Colias hyale*, *C. edusa* and ab. *helice*, *Gonepteryx rhamni*, *G. cleopatra*.

NYMPHALIDÆ.—*Dryas paphia*, *D. pandora*, *Argynnis aglaia*, *A. adippe*, *Issoria lathonia*, *Melitaea phoebe* (very varied), *M. didyma* (including one small male, probably of the third brood), *M. athalia*, *M. cinxia*, *Pyrameis cardui*, *P. atalanta*, *Euvanesa*

antiopa, *Vanessa io*, *Aglais urticae* (only one taken). *Polygonia c-album*, *Limenitis camilla*, *Apatura iris* (seen at Avignon), *Charaxes jasius* (seen near Amélie-les-Bains).

SATYRIDÆ.—*Pararge megaera*, *P. egeria*, *Satyrus hermione*, *S. fidia*, *S. alcyone*, *S. circe*, *S. statilius*, *Enodia dryas*, *Hipparchia briseis*, *H. semele*, *H. arethusa*, *Epinephele jurtina* var. *hispulla*, *E. tithonus*, *E. ida*, *Coenonympha pamphilus*, *Erebia epiphron* var. *cassiope*, *E. neoridas*, *E. tyndarus* var. *rondoui*, *Melanargia galatea*.

FURTHER NOTES ON SARROTHRIPUS REVAYANA, SCOP.

BY W. G. SHELDON, F.Z.S., F.E.S.

AT the sale of the concluding part of the Farn Collection on the 4th inst. the rather extensive series of this species came into my possession; and as it included three very interesting specimens, I am writing this note as an addenda to my paper on *S. revayana* which appeared in vol. lii of this magazine. In this paper I alluded to the *supposed* type-specimen of ab. *stoninus* described by Curtis, and which is at present in the possession of Prof. Image. Now this specimen was formerly in the collection of Dr. P. B. Mason, who acquired it from the late Edwin Shepherd, whose collection he purchased "en bloc." Unfortunately it does not agree with Curtis's description of ab. *stoninus*, and I have therefore named it ab. *sagittata*, and figured it, fig. 4 on plate. I have also figured the true ab. *stoninus*, fig. 5. Now amongst Farn's specimens is an example of ab. *stoninus* labelled as such, or rather as "ab. *stonanus*, Sheppard."* This example was on one of the old round-headed pins and would thus in any case date *ante* 1850, or possibly about the date (1829) in which year Curtis named the aberration. The specimen was no doubt acquired by Farn at the sale of the late A. F. Sheppard's Collection (with which was incorporated that of E. Sheppard) in 1889. I am wondering whether the specimen was not the actual type that Curtis described. Curtis never possessed a type, and apparently the example he described was in the possession of a collector, Stone, well known in those days. Curtis says it was taken at Darenth. Both Stephens and Westwood, however, speak of it as taken at Birchwood. They each write of one example only, and I cannot find any evidence that more than one was known in those days, when it was unquestionably extremely rare. In any case an example of such an age labelled as ab. *stonanus* is satisfactory proof that the old Lepidopterists correctly understood the form.

* Stephens and Westwood both corrected Curtis's ungrammatical name of *Stoninus* to *stonanus*; but as Curtis himself adhered to his first name, although he had several opportunities of correcting it, I have, following the law of priority, adhered to his nomenclature.

The second interesting specimen in the Farn Series is an example very close to the very rare (in Britain at any rate) type form. Scopoli describes this—"Superior wings greenish grey with fuscous longitudinal lines." The Farn specimen was clear grey with a slight brown tinge, superiors with blackish longitudinal lines, a black discal spot, and *slight* indications of dark transverse waved lines. There is no trace in this specimen of the reddish-brown ground-colour of the superiors of *ab. ramosana*, Hüb., and it certainly is nearer to the type than any example I have seen. It is labelled "New Forest, A.B.F."

The third noticeable specimen is an example of *ab. degenerana*, Hüb. At the date I wrote my paper I had only seen one example of this the most beautiful of all the *revayana* forms, purporting to be of British origin, which was said to have been taken by a professional collector, E. Morris, in the New Forest. Since then I discovered there was an example in the Webb Collection, acquired by him from the Briggs Collection in 1896, and originally in the Howard Vaughan Collection. This example is the one alluded to by Barrett in 'Lep. Brit. Isles,' vol. vi, p. 235, and is described in the last few lines at the bottom of the page. I am not aware that the place of origin of this specimen is known. At the Webb sale the name of the purchaser was not disclosed, and therefore I do not know its present location.

The Farn *ab. degenerana* is labelled "Chattenden," without any indication of the name of the captor, or of the source from which Farn obtained it. The example is set in the English fashion, with wing slope rounded; it was mounted on a gilt pin of the usual British make, and apparently was set between the dates 1850 and 1890. It is of the average size of *S. revayana*, expanding about 24 mm.; whereas Continental examples of this form are usually considerably larger than other forms. There does not seem any reason to suppose that this is anything but a genuine British example. The Farn series of *S. revayana* was badly affected by verdigris, and I have for this reason removed the old pins, and substituted for them verdigris-proof pins.

April 12th, 1922.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 110.)

9. PROCTOTRYPES BUCCATUS, Thoms.

Proctotrupes buccatus, Thoms., l.c., p. 421, ♀. *Serphus buccatus*, André, l.c., p. 302, ♀.

Though only recorded from Sweden, this is not an uncommon species with us, and seems confined to the autumn. It ranges from August 9th, when I took it in the West Leake Woods, near Nottingham, in 1914, to October 8th, when it occurred under some sacking lying on the ground in Dodnash Wood, in Suffolk; it has occurred by sweeping at Blythburgh Wood, and I have noticed it on the Lowestoft cliffs flying slowly and hovering over the sand, about half-way up their face, on an oppressively hot morning with slight westerly breeze. Foxhall (Tomlin): Tostock, near Bury St. Edmunds (Tuck); Felden, in Herts (Piffard).

10. PROCTOTRYPES ELONGATUS, Hal.

Proctotrupes elongatus, Hal., *l.c.*, p. 11, ♀. *Serphus elongatus*, André, *l.c.*, p. 302, ♀.

Somewhat rare in northern Ireland, "in litoribus" (Haliday), which Kieffer considers to mean "rivage de la mer." It has not been anywhere discovered since first described in 1839, and is said to be similar in its abdominal and terebral structure to *Paracodruss apterogynus*; nor is the male yet known.

11. PROCTOTRYPES CALCAR, Hal.

Proctotrupes calcar, Hal., *l.c.*, p. 12, ♂ ♀; Voll., *l.c.*, p. 28, pl. xix, fig. 10, ♀. *P. calcaratus*, Thoms., *l.c.*, p. 419, ♂. *Serphus calcar*, André, *l.c.*, p. 306, ♂ ♀.

The large radial cell, combined with elongate pale legs and evenly sculptured metathorax, render this a very distinct species.

A common insect in woods from spring to autumn, extending throughout Europe, from Sweden to Spain and Algeria. Haliday considered it very common in woods and among grass on coast sandhills, and recorded it from England. For its most interesting parasitism upon the centipede, *Lithobius forficatus*, cf. Edward Newman's paper in 'The Entomologist,' iii, 1867, p. 342, "A Proctotrupes Parasitic on a Myriapod"; I know of no subsequent breeding. One of our commonest species, at least in the east of England, and ranging from early May to September 8th, most abundant in June. About half my localities are on the coast, but it also frequently occurs inland in marshes, and sometimes on lime-tree honey-dew, at Barton Mills, Mildenhall, Monks Soham, and Walberswick in Suffolk; Bury St. Edmunds (Tuck); Mablethorp, in Lincs, and Newstead, in Notts (Morley); Clacton-on-Sea (Newbury); Felden, in Herts, several (Piffard); Reigate, in Surrey (W. Saunders); Lyme Regis, in Dorset (Chitty); New Forest (Lyle); Olveston, in Gloucester (Charbonnier); Arnold, Edwinstow, in Sherwood Forest and Aspley Woods in June, Thorney in August; and Epperstone Park during September, in Notts (Carr); Killarney, in S.W. Ireland.

12. PROCTOTRYPES CURTIPENNIS, Hal.

Proctotrupes curtipennis, Hal., l.c., p. 12. *Serphus curtipennis*, André, l.c., p. 300, ♀.

Instantly known by its brachypterous condition; but the structure, and especially that of the metathorax and terebra leaves little doubt that it is a mere form of *P. calcar*. Two specimens alone are recorded, both from England, but unlocalised; one was taken by John Curtis long before 1839, as mentioned in his Guide of that year (Haliday), and the other is in Marshall's collection, which is in the Vienna Museum. It has not been found in Ireland, *pace* Kieffer. I am the fortunate possessor of a third specimen, kindly given me by Rev. H. S. Gorham, who captured it during 1907 at Malvern, in Worcester; and Dr. W. J. Fordham found another in 1917 at Bubwith, near Selby, in Yorks.

13. PROCTOTRYPES SETICORNIS, Thoms.

Proctotrupes seticornis, Thoms., l.c., p. 419, ♂ ♀. *Serphus seticornis*, André, l.c., p. 304.

Hitherto known only from Sweden. A single female was swept by me so long ago as October 7th, 1899, in a very swampy alder wood in the Bramford marshes, near Ipswich; and another on June 14th, 1907, from bracken in the particularly dry Wilverley Inclosure of the New Forest. But actually I expect it to be one of our commonest, though overlooked, species, for fully a dozen were sitting quiescently below lime-leaves on June 20th, 1919, in my Monks Soham garden after a thunderstorm.

14. PROCTOTRYPES FUSCIPES, Hal., ♂ ♀.

Proctotrupes fuscipes, Hal., l.c., p. 13, ♀. *Serphus fuscipes*, André, l.c., p. 307, ♀.

Taken near Edinburgh during September; also very rarely in northern Ireland (Haliday). Not rediscovered since first described, and the male is hitherto unknown, though it differs only sexually from the female, and the species is really one of our commonest. It is on the wing from May 18th, when it emerged with the above *Disogmus areolator*, to September; usually swept from reeds and rushes in marshy places, but it also occurs in some numbers on honey-dew on lime leaves in my garden here, especially during thundery weather late in the day. Felden in Herts (Piffard); Sherwood Forest in June (Carr); in a wicker beehive at Bury St. Edmunds (Tuck); Rookley Wildness in Isle of Wight (Morey); and Banchory in the Kincardine highlands of Scotland (Elliott). My numerous examples are from Brandon Staunch, Monks Soham, Henham Park, Barton Mills, Ousden on banks of the River Kennet, Easton Broad, Southwold, Reydon, Westleton, in Suffolk, Louth in Lincs, and Chippenham Fen in Cambs.

15. PROCTOTRYPES PALLIPES, Jurine.

Codrus pallipes, Jur., Nouv. Méth., 1907, p. 309, pl. xiii, gen. 46, ♂; Nees, *l.c.*, p. 356, excl. syn. et var. *Proctotrupes pallipes*, Latr., Gen. Crust. et Ins., p. 38; Hal., *l.c.*, p. 11, ♂ ♀; Thoms., *l.c.*, p. 418, ♀; Voll., *l.c.*, p. 29, pl. xix, fig. 1. *Serphus pallipes*, André, *l.c.*, p. 309.

This species should certainly be ascribed to Jurine, and not to Haliday as is done in André; for nothing in the former's account is inaccurate but the antennal coloration, which is depicted as flavidous throughout. Haliday's two varietal forms appear quite different to me. The centrally produced propleuræ are distinctive of the present species.

Wide-spread from Hungary to Sweden; Vollenhoven records it (*l.c.*), as preying on the fungus-gnat, *Macrocera maculata*, Mg. Frequent everywhere in woody places in Britain (Haliday and Walker). I have found it very far from common, and pretty well confined to the month of June; it has always turned up at random in the sweep-net, or flying in sunshine, and several times in shady places in woods at Foxhall, Wherstead, Ipswich, Barton Mills and Tuddenham in Suffolk; Market Rasen in Lincs; Helpstone Heath near Peterborough, and Matley Bog in New Forest. There seems to be an entirely different mode of life to the above Mycetophilid suggestion, for Kawall says ('Stett. Entom. Zeit.', 1855, p. 260): "Many years ago, I found under a stone a shrunken beetle larva, which undoubtedly belonged to the *Staphylinæ*, dead. In it were several parasites in naked pupal state; these proved to be *Codrus pallipes*, Jur."; and there is no reason to suppose that he mistook *P. viator* for the present species, as I myself did ('Trans. Entom. Soc.', 1911, p. 453), in ascribing Mr. Step's breeding to it.

(To be continued.)

NOTES AND OBSERVATIONS.

THE DIPTEROUS FAMILY BLEPHARICERIDÆ.—Macquart (1843) wrote *Blepharicera*, but this was amended to *Blepharocera*, and the family has been called Blepharoceridæ. It seems evident that the original spelling must be restored, and the family name changed to Blephariceridæ. Were we to permit such changes in the spelling of generic names, it would be impossible to save the name of the Blepharicerid genus *Philorus*, Kellogg, long antedated by the Lepidopterous *Philoros*, Walker.* I will take occasion to record that by St. Vrain Creek, above Peaceful Valley, Colorado, August 23rd, I found the Blepharicerid *Bibiocephala elegantula*, V. Röder, preying upon the subimago of a mayfly (Ephemeridae).—T. D. A. COCKERELL.

* If we consider an "emendation" equivalent to an error in spelling, and hold to the "one-letter rule," the Lepidopterous *Blepharocera*, Chambers, stands, preoccupied neither by the Dipterous genus nor by *Blepharocerus*, Blanchard. This seems to me the proper course, following the spirit of the International rules, and the obviously wise principle that names should not be changed without absolute necessity.

VANESSA ANTIOPA IN SURREY.—In reply to inquiries made, Col. G. J. Farmar has kindly given me the following particulars respecting a specimen of *V. antiopa* seen by him at Camberley, Surrey, on April 10th last: "It was a warm, bright day and the butterfly was sunning itself on a bank bounding the Portesbury Road, just off the High Street, which is not much frequented, and at that particular part separates the road from a small plantation. It was a very perfect specimen, wings and body not in the least rubbed. I watched it for some minutes at a distance of a couple of yards. It was still there when I left." It is always interesting to record the appearance of *antiopa* in this country, especially those which have hibernated, as comparatively few have been recorded during the spring months. In my series of twelve British-caught *antiopa* only two are hibernated examples.—F. W. FROHAWK.

VANESSA C-ALBUM IN BUCKS.—On May 6th I was surprised to capture a specimen of *Vanessa c-album*; it was flying at Aston Hills near Tring. Apparently there are no other records of this insect from the Tring district in the back numbers of the 'Entomologist.'—G. E. TITE; Park Road, Tring.

HIPPOTION CELERIO IN DEVONSHIRE.—Cadet T. E. Podger, who is an enthusiastic young collector, has written to me from Dartmouth Royal Naval College, stating that a female specimen of this insect has been taken at rest in one of the College sheds on May 13th.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

A STRIPED HAWK MOTH (*H. celerio*) was found here last Saturday, (May 13th) by Chief Stoker Seccombe fluttering about the boats near the river. It was caught, and I have the insect. I think it is a male.—R. M. MILNE; R.N. College, Dartmouth, May 18th, 1922.

VANESSA IO AB. BELISARIA.—It may be of interest to record that a specimen of this aberration of *V. io* (the "blind" Peacock) was captured at Selworthy in August, 1919, by Miss Thompson, of 97, Albemarle Road, Beckenham, and recently shown to me.—N. D. R.

NOTES FROM BROCKENHURST.—*Cicindela campestris*: The green Tiger Beetle is exceedingly abundant; I never saw so many. Apparently the hot summer was good for them. *Gonepteryx rhamni* has been common on suitable days, as usual. *Vanessa io* appeared on April 19th, apparently just out of hibernation. *V. atalanta*: On May 5th I saw two, which I think must have hibernated. *P. egeria* was first seen on April 26th: it has since become very common. *Cyaniris argiolus* was first seen on May 6th; it is now pretty common. I have seen only one *Aglais urticae*—on May 7th—and but one *Heodes phlaeas**—on May 12th. The season of course is very late—perhaps a fortnight behind.—W. J. LUCAS.

PERCNOPTILOTA FLUVIATA AND OTHER CAPTURES IN WESTMORLAND.—I should like to record the capture of *P. fluviata* in Witherslack on May 11th last. This moth was taken at car head-lights in a lane at 10.30 dusk. Its identity has been confirmed. Night work has been difficult this year, much snow in the mountains off and on until mid

* One or two *H. phlaeas* have been seen on parade banks at Clacton each sunny day from 12th May.—R. S.

May and all "earliest dates" for the year behind time. The only early arrival was *C. glaucata* on April 21st at Holker. Sallow work has been very bad indeed, and most work done by "light." The past week has been very bad, with high winds or heavy rain each night. I am told that *Euchaeca obliterata*, which I found locally common in 1921, and *Perizoma affinitata*, of which we took six in 1921, are new records for the district. Up to May 13th fifty-one local "earliest dates for 1922" have been listed.—Dr. LOWTHER; Grange-over-Sands, May 17th, 1922.*

DEIOPEIA PULCHELLA BRED FROM S. DEVON LARVA.—A friend of mine brought me, last year, from a South Devon locality, a larva that was not known to me. I fed it upon forget-me-not (*Myosotis*), for which plant it appeared to entertain a partiality, subsequently pupating. I have since forced through the resulting pupa, from which a fine specimen of *D. pulchella* emerged last Saturday. I write this as it might be interesting to record in the 'Entomologist.'—J. M. JAKES; The Red House, Banstead, Surrey, April 20th, 1922.

OCCURRENCE OF FORFICULA AURICULARIA, LINN., VAR. FORCIPATA, STEPH. IN SURREY.—I found about 8 to 10 specimens of this variety in an old rotten gate-post, about 4 foot high, near Wisley Bridge, Surrey, on March 10th, 1922. There were no other earwigs present in this spot, only that particular variety, and all, of course, of the male sex.—G. FOX-WILSON; Entomological Dept., Royal Horticultural Society's Gardens, Wisley, Ripley, Surrey.

RHOPALOCERA FROM RHODES, SAMOS, GALLIPOLI, ETC.—The following notes from the Islands of Rhodes and Samos, the country round Maidos on Gallipoli, and the Island of Afisia in the Sea of Marmora, may be of interest. We only stopped at the above places for a very short time, and at Samos and Afisia I was only able to get ashore for a couple of hours between 5 and 7 p.m., local time. The weather, except at Gallipoli, was very bad, and collecting at Rhodes was done during a very heavy thunderstorm, which lasted two or three days. I am indebted to Major P. P. Graves for the identification of the specimens of *S. hermione* from Rhodes, *E. lupinus*, *E. telmessia* and *A. hyrax*, and for confirmation of identification of *P. zephyrus*. Owing to weather and time at my disposal, Gallipoli, in the neighbourhood of Maidos, is the only one of the above places which can be considered to have been thoroughly worked.

A. = Afisia, G. = Gallipoli, R. = Rhodes, S. = Samos.

Papilio podalirius, R., one. *P. machaon*, R., larva full fed; G., imago. *Aporia crataegi*, G., common, worn. *Pieris brassicae*, R., *P. rapae*, G., A. *Pontia daplidice*, R., G. *Leptidia sinapis*, G. *Colias edusa*, G., plentiful; var. *helice*, G., one. *Gonepteryx cleopatra*, S., one. *Argynnis maia* (*pandora*), G., fairly common. *A. lathonia*, G., one fresh male. *Melitaea didyma*, G. *M. phoebe*, G. *Polygonia egea*, S. *Vanessa polychloros*, S., three females; G., not uncommon. *Pyrameis atalanta*, S., G., A. *P. cardui*, R., S., G. *Limenitis camilla*, S., G. *Pararge roxelana*, R., S., common; A. *P. maera*, R., tolerably common; in proportion to *megaera* of 7:4; S., equal proportion to *megaera*. *P. megaera*, R., S. *Coenonympha pamphilus*, G. *Satyrus circe*, A., one fresh male. *S. hermione*, R., one worn male and two

fresh females; more unicolorous grey on the underside of the hind wings, and more fulvous on the upperside of the fore wings along the submarginal band than Constantinople specimens; considered by Major P. P. Graves to be a race local to Rhodes, the specimens from Samos approximating to Constantinople specimens. *S.*, common. *S. briseis*, *G.*, males common and in very good condition; females just emerging, two taken. *S. semele*, *S.*, common. *Epinephele lupinus*, *G.*, plentiful along the dried-up water-courses, keeping to the shade; *A. E. jurtina*, *G.*, *A. E. telmessia*, *R.*, *S.*, males few in number and very worn; the females common and in good condition; the apical eye on all females examined, except one, was bipupillated both above and below. *Melanargia larissa*, *G.*, absolutely swarming everywhere, especially amongst patches of Scabious; by far the commonest butterfly on Gallipoli, where insects of all descriptions were very plentiful; formed about 70 per cent. of the butterflies seen. *Thecla ilicis*, *S.*, *G.* *Heodes thersamon*, *R.*, one female. *H. phlaeas*, *R.*, *S.*, *G.* *Lampides baeticus*, *R.*, common; *S.*, one female. *Tarucus telicamus*, *S.*, several seen. *Polyommatus argus*, *G.*, very worn. *P. zephyrus*, *G.*, two males and three females. *P. bavius*, *G.*, two females, somewhat worn. *P. astrarche*, *S.*, *G.* *P. icarus*, *R.*, *G.*, *A.* *P. amandus*, *G.*, one male, worn. *P. thersites*, *R.*, several taken in fairly good condition. *P. argiolus*, *S.*, *G.* *Carcharodus alcaeae*, *R.*, *G.* *C. orientalis*, *G.* *Hesperia sidae*, *G.*, one female in fair condition. *H. orbifer*, *A.*, one fresh female. *Adopaea actaeon*, *R.*, *G.* *A. thauumas (flava)*, *G.*, common. *A. hyrax*, *S.*, one worn male. *Augiades sylvanus*, *G.* *Gegenes nostrodamus*, *G.*, common in one small area.

The dates for the above captures or observations are as follows: Rhodes, June 5th and 6th, 1921; Samos, June 8th, 1921; Gallipoli, June 10th, 11th, 12th and 13th, 1921; Afisia, June 16th, 1921.—E. B. C. BETTS; Observer Officer, R.A.F.

ATTRACTIVENESS OF LIGHT FOR MOTHS.—The notes under this heading in the last two issues of the 'Entomologist' open up a most interesting question. Many old lepidopterists must have noticed, as I have done, that even the old-fashioned oil-lamps were not all equally attractive, or equally attractive on all nights. Sometimes every moth appears to "come to light," while perhaps on the following night, though equal numbers may be upon the wing, comparatively few will be taken. With street lamps my experience has not been very extensive, but when motor cars first came in I used to find the lights they carried (or some of them at any rate) very attractive; nowadays one seldom sees insects fluttering round the dazzling head-lights. To turn to another aspect of the question, there seems no reason to doubt that the antennæ of certain insects (midges as well as moths) may play a part as emitters and receivers of sound-waves, but that any such "calls" could originate from a lamp I should think extremely doubtful. In any case, like would surely only call to like. The same call would not bring up the other species, nor the crowd of other moths, beetles, flies, and even other creatures, commonly attracted to one and the same lamp. It would surely follow that it is the light only which attracts, and it would be very interesting if somebody could demonstrate why one form of light is more attractive than others, or if some light-rays are actually repel-

lant. That scent is certainly the chief (if not the only) sense that attracts male moths to a female would seem to be proved by the fact that the box, or pocket, in which the female may have been carried does not instantly cease to be attractive with the removal of the captive, or with the ending of her life. I have seen Eggars and Emperors drawing up wind to a female for quite surprising distances, but I never remember to have seen one come in the contrary direction.—GEORGE BOLAM; Alston, April 24th, 1922.

FLASHLIGHT PHOTOGRAPHY AND NATURE.—At a recent meeting of the Lancashire and Cheshire Entomological Society Mr. Wilkinson showed how the student who had little daytime leisure for camera work could obtain better results at night by means of flashlight, and at the same time gather a series of records of nocturnal habits of insects and other creatures of great value to science. There is a vast field of research in this direction, for as yet only the fringe has been touched, and the speed of the exposure—about $\frac{1}{5000}$ th of a second—makes the operator almost independent of the movements of the subject. The slides showing the change of the caterpillar of *Pyrameis cardui*, for instance, proved this unmistakably: during the process of getting rid of its old skin the caterpillar is in a state of rapid oscillation, but the photographs were as clear and definite as if the insect had been at rest. The succession of pictures showed the different stages of this metamorphosis from the first spinning up of the larva to emergence of the butterfly.—CHARLES P. RIMMER.

RECENT LITERATURE.

INDEX ANIMALIUM: 1801–1850. Pt. I: Introduction, Bibliography and Index—A–Aff. By C. D. SHERBORN. 8vo. Pp. i–cxxi and 1–128. London: By Order of the Trustees of the British Museum, 1922.

Zoological workers in all groups who know a good thing when they see it, and especially those who value accuracy in nomenclature, will welcome with thanksgiving this further instalment of the fruits of Mr. Sherborn's years of self-sacrificing labours. To catalogue a small group of animals is no light task; to index accurately all the names applied to animals over a period of fifty years is indeed heroic. The amount of work done is clearly shown by the great length of the bibliography, which alone will save many trying hours of labour to other workers in this field. There can be no two opinions as to the value of the work; it is indispensable. We strongly advise *all* systematic workers to get it and to use it.

N. D. R.

Report of the Proceedings of the Fourth Entomological Meeting held at Pusa, February, 1921. Edited by T. BAINBRIGGE FLETCHER, R.N., F.L.S., etc. Pp. xii + 401. Plates I–LVII. Calcutta: Government of India, 1921.

Naturally composed mainly of matter of economic interest, this volume is quite up to the standard of its forerunners in quality if not in bulk. Well over half the volume is devoted to lists of crop pests, observations on miscellaneous pests; forest, medical and veterinary

entomology, lac, etc. Amongst the papers on bionomics, systematic entomology, etc., we note "A Check List of Coccidæ of the Indian Region," by T. V. R. Ayyar, and a paper on the "Proportion of ♀ forms of *Papilio polytes*, L., in Dehra Den, U.P., and Bihar," by Prof. E. B. Poulton. But it is impossible even to indicate the scope of the work in the space at our disposal, its interests are so many and varied.—N. D. R.

The Scottish Naturalist, March to April, 1922.

Apart from a number of notes and articles of general interest, varying from the homing of salmon to the history of feathers, this number contains a valuable and well-illustrated article, "Notes on Aphides from Sutherland," pt. i, by Miss Dorothy Jackson, whose work on this group is already widely known.—N. D. R.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 15th, 1922.*—Prof. E. B. Poulton, M.A., F.R.S., etc., Vice-President, in the Chair.—The following were elected Fellows of the Society: Messrs. Reginald Charles Treherne, Entomological Branch, Department of Agriculture, Ottawa, Canada; T. G. Sloane, Moorilla, Young, New South Wales, Australia; William Monod Crawford, B.A., Orissa, Marlborough Park, Belfast; Leonard Charles Bushby, 11, Park Grove, Bromley, Kent; Arthur Morel Masee, "Park Place," The Common, Seven Oaks, Kent; Linnaeus Greening, "Fairlight," Grappenhall, Cheshire; John Wilson Moore, 151, Middleton Hall Road, Kings Norton, Birmingham; John Edmund Eastwood, Wade Court, Havant, Hants; Dr. Francis Arthur, M.R.C.S., L.R.C.P., 395, Bethnal Green Road, E. 2; and Dr. H. Silvester Evans, M.R.C.S., L.R.C.P., Lautoka, Fiji. *Exhibits.*—Mr. W. H. Tams exhibited a selection of insects, chiefly Lepidoptera, taken on the Mount Everest expedition.—Mr. O. E. Janson exhibited a new species of *Euchroea* and a female of the rare Saturniid moth *Argema miltrei* from Madagascar.—Dr. C. J. Gahan exhibited an example of the Indian Phasmid *Carausius morosus*, in which homœotic regeneration had taken place, an amputated antenna having been replaced by a tarsus.—Prof. E. B. Poulton, F.R.S., who illustrated his remarks with lantern-slides, read some notes by Mr. A. H. Hamm on the occurrence of *Syntomaspis druparum* in hawthorn seeds in birds' droppings, and some notes by Dr. R. C. L. Perkins on the procryptic resting attitude of *Polygonia c-album*. He also exhibited some Chalcids bred by Mr. J. Collins from beetles in dog biscuits and plum branches.—Dr. S. A. Neave read a letter from Mr. W. J. Harding recording the capture of *Grapta c-album* at Holcombe in Devonshire, and some discussion took place as to the distribution and recent spread of this butterfly in the south of England.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*February 23rd.*—The President in the Chair.—Mr. Cheeseman, 30, Clayton Road, S.E., was elected a member.—Mr. Hugh Main exhibited slides illustrating the latest results of colour photography, and series of slides illustrating the life-history of the field-cricket and the wolf spider *Lycosa*.—Mr. Frisby, slides showing the Serotine bat, nests of water-fowl, and

British orchids *in situ*.—The President, slides of the liverwort showing remarkable proliferous growth, of "fairy flies" and of the tracheæ of a beetle.—Mr. Syms, slides of the ova of the more local species of British butterflies.—Mr. Tonge, slides of the ova of a number of British Geometers.—Mr. Staniland, slides of the galling of the wild crab by the woolly aphid *Eriosoma lanigera* and of the Syrphid (*Syrphus vitapennis*).—Mr. Withycombe, a curious fungus growth from a dead ant, a nest of *Osmia rufa* in a door lock, the egg-mass of *Empusa pauperata*, the life-history of a *Coniopteryx*, etc.

March 9th.—The President in the Chair.—Mr. G. C. Champion, A.L.S., F.E.S., was elected an honorary member; Mr. L. C. Bushby, of Bromley, and Mr. A. M. Masee, of Sevenoaks, were elected members.—Captain J. Ramsbottom, F.L.S., gave a lecture on "Symbiosis of Fungi and Orchids," illustrated with lantern-slides and diagrams.—HY. J. TURNER, *Hon. Sec.*

SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—January 23rd, 1922.—The annual meeting was held at Huddersfield at the invitation of Mr. G. T. Porritt.—The President, Mr. B. Morley, was in the Chair.—After election of officers for 1922 and new members, Mr. Mosley, the Curator of the new Huddersfield Museum, made an appeal for the co-operation of the Society in working out the entomology of the district and supplying material for the museum collections.—*Exhibits*: Mr. G. T. Porritt, a specimen of *Ptychoptera minuta* taken by himself at Hornsea, Yorks, June, 1908, probably the earliest known example of this fly.—Mr. B. Morley, various Hepialids, including the whitish Wicken form of *H. lupulinus* and *H. humuli*, var. *thuleus*; *Larentia concinnata*, Arran, and varied series of *L. truncata*, including ab. *rufescens*, from Skelmanthorpe; *Lygris populata*, ab. *musauaria*, from Penistone; *Acronycta menyanthidis*, ab. *suffusa*, a second-brood specimen from Penistone; aberrations of *Agrotis nigricans*, *Lygris testata* and *Ephyra pendularia*.—Mr. Mosley, a collection of Micro-lepidoptera taken at Diggle and presented to the Museum by Mr. F. Buckley.—Mr. E. A. Smith, a long series showing range of variation in *Agrotis fimbria*, Elland, 1921, one specimen having the band of the hind wing traversed by white rays.—Mr. E. Cocker, aberrations of *Arctia caja*, one with yellow and one with heavily-suffused hind wings.—Mr. J. Hooper, series of hybernids, including melanic *H. leucophearia* and *H. aurantiaria*, ab. *fusca*.—Mr. W. Buckley, *Euchloë cardamines*, ♂, with the patches of a faded lemon colour, a faint sub-terminal grey streak and a grey streak prolonging discal spot to costa.—Mr. W. Dyson, two aberrant specimens of *Pyrameis atalanta*, portions of the bands in one being of a bright orange colour.—Mr. T. Fisher, aberrations of *Xanthia lutea* having the "pink bar" intensified and brown in colour; aberrations of *Abraxas grossulariata* including ab. *nigrosparata*.—Dr. H. D. Smart, a series of *Camptogramma bilineata*, including ab. *atlantica* and ab. *isolata*; *Ennomos quercinaria*, banded and melanic forms; melanic forms of *Hemerophila abruptaria*, *Tephrosia consonaria* and *Acidalia virgularia*.—Mr. Porritt, as far as time allowed, showed portions of his collection of British Lepidoptera, a description of which is beyond the scope of these notes.—H. D. S.

OBITUARY.

ARTHUR W. BACOT.

ENTOMOLOGY—one may add, indeed, the Nation—has suffered another irreparable loss in the death of Arthur W. Bacot, briefly announced in the May number of the 'Entomologist.' Still in the prime of life, and in the midst of varied and important scientific researches, he had, by permission of the Lister Institute, gone to Egypt in Government service for investigations into typhus, and at Cairo he made the "supreme sacrifice" on April 12th. Call the contracting of the fell disease what we may—an unavoidable accident or a result of insufficient precautions—the greatness of that sacrifice remains; and while we deplore the tragedy, we cannot but recognise in it a fitting coronation of a life of singular unselfishness and devotion.

Bacot first became known to the entomological world as a lepidopterist, and during the early nineties of the last century rapidly attained to front rank, mainly owing to his careful work in breeding, his accuracy in describing, and his genius for sound inductive reasoning from his observations. Although he was a keen field-naturalist, the mere collecting for collecting's sake had little attraction for him; to obtain the material was ever a challenge to him to use it for some scientific end. Having assimilated, with surprising quickness and thoroughness, not only the biological theories of the greatest masters (Galton, Weismann, Mendel and others), but also the detailed descriptive methods of Dyar and Chapman on larvæ, pupæ, etc., he devoted himself with the greatest assiduity to the elucidation of the life-histories of a number of our British species and groups, notably some of the Sphingids, *Endromis*, the *Liparidae*, and—in connection with Tutt's monumental 'British Lepidoptera'—the *Lasiocampidae* and *Psychidae*.

Most of his earlier papers were produced under the auspices of the smaller natural history societies (the City of London and North London), in which he was a leading light, and were published or re-published chiefly in the 'Entomologist's Record,' vols. iv to xviii. He did not join our premier entomological society until November, 1901, but was thenceforth a regular exhibitor and a valued participant in the discussions.

It was one of the crimes of our economic system that for many years Bacot's best hours were claimed by routine work in a City office, but the reward of his arduous labours as an amateur came when, in 1911, he was appointed Entomologist to the Lister Institute of Preventive Medicine, and thenceforth he was able to follow untrammelled his natural bent for scientific research.

In 1914 appeared Bacot's monograph on the bionomics of the common rat fleas, a research undertaken at the invitation of the Commission for the Study of the Plague in India. This work, which stamped Bacot as an investigator of high order, was carried out at his home in Essex, and during the time that he was forced to work all day at the office. He had the services of an assistant to carry out his instructions whilst absent, but even so the difficulties were great.

Bacot continued his work on the rat fleas at the Lister Institute, where he was able to study plague-infected individuals. In 1913, in collaboration with Dr. C. J. Martin, there was published an important paper demonstrating the mechanism of the transmission of plague by the rat flea.

In 1914-15 Bacot acted as Entomologist to the Yellow Fever Commission sent out by the Colonial Office to Sierra Leone. During the year August, 1914, to July, 1915, he studied the bionomics of *Stegomyia fasciata*, the mosquito which transmitted the disease. These studies formed the subject of a very complete monograph published in 1916 by the Yellow Fever Commission. All engaged in combating mosquitoes or in studying their bionomics will find a mine of information in this work.

Upon his return to England in 1915 he began a long series of experiments on lice to determine what methods were most suitable for ridding our soldiers of this pest. The experiments were always made upon himself and conformed very nearly to conditions in the field. In 1916 he accepted the post of Honorary Entomological Adviser to the War Office. He made valuable recommendations on the louse problem, and all devices and substances for combating this evil brought to the notice of the military authorities were submitted to Bacot for tests and reports.

In 1917 he was invited to join the British Trench Fever Committee appointed by the War Office. The study of the louse had now become more vital than ever as it was thought to be the agency transmitting trench fever. Bacot and his colleague Dr. J. A. Arkwright demonstrated the existence of minute organisms, similar to the *Rickettsia* associated with typhus, in the gut of lice fed upon patients suffering from trench fever. It was further established that only lice carrying these organisms were capable of transmitting the disease.

At the close of the War he turned his attention to typhus. In 1920 he went to Poland with the Typhus Research Commission of the League of the Red Cross Society. Returning to London in a few months he pursued his experiments in an endeavour to decide as to the real nature of the typhus virus. Circumstances were not favourable, and he welcomed the opportunity of going to Egypt at the invitation of the Egyptian Government. Accompanied by his colleague Arkwright, he commenced work early this year in the laboratories of the Public Health Department in Cairo. The research advanced most hopefully, and had already confirmed the statement of an earlier worker that the excreta of infected lice were capable of conveying the disease. At the end of March both men were struck down, but we are glad to hear that Arkwright is making a good recovery.

Bacot was never reckless, and was always most careful in his oftentimes dangerous work. Like several other distinguished students of typhus there is little doubt that he fell a victim to some accident. The nature of the disease and of the insect carrying it renders this research one of the most dangerous nature. As Dr. Greenwood has well remarked: "If ever any man earned the Victoria Cross 'for valour,' that man was Bacot."

He will be remembered by all who knew him as ever helpful and

considerate. Those whose privilege it was to work with him at the Institute found him inspiring and original, and ever ready to give the best of his wide knowledge whenever his advice was sought.

A very appreciative notice of Bacot and his work, from the pen of Dr. C. J. Martin, Director of the Lister Institute, appeared in 'Nature' on May 13th. To this we are indebted for several details concerning the medical side of Bacot's work, and without which any notice would be incomplete.

L. B. P. AND G. T.

R. F. L. BURTON.

All scientists who knew him, those particularly of his native county, Shropshire, much regret the passing of Richard Francis Lingen Burton, of Longner Hall, Shrewsbury, after a long illness, on January 8th last. Born in 1864, and educated at Eton, he was a man of varied attainments, especially devoted to botany and zoology, including entomology. Having lived many years in New Zealand, where he farmed on a large scale, he knew the fauna and flora of that country most intimately, and was successful in growing at Longner many of the endemic plants, which stood the English climate better than might have been imagined. He paid particular attention to the Orchidaceous tribe, both British and New Zealandic, and likewise studied Culicidæ, publishing an account of our British mosquitoes, most of which were found to occur on his estate, bordered as it is by the River Severn for a long distance. He also discovered the rare bee-fly (*Pocata apiformis*) to be a native of Salop, and aided much in the compilation of the preliminary Catalogue of the Diptera of this country, which was published in the 'Ent. Mo. Mag.' for November, 1920.

J. C. M.

H. FRUHSTORFER.

We very much regret to announce the death of Hans Fruhstorfer at Munich on April 9th last after an unsuccessful operation for cancer. He was only in his fifty-fifth year.

A man of genial disposition and of untiring energy and boundless entomological enthusiasm, devoted almost entirely to the Rhopalocera, he had during the last 25 to 30 years produced a prodigious number of papers on that subject and written a very large proportion of the Rhopalocera Section of Seitz' Exotic Macro-Lepidoptera, largely based on the results of his own collecting trips abroad. His work contains unfortunately many errors—he worked too fast to allow himself time to check his detail—and in the matter of his racial names many without doubt will have to be discarded. But there will always remain a great deal of value; he is without doubt a great loss to Entomology.

N. D. R.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—Chi, Xanthographa, Instabilis, Baja, Cruda, Rurea, Suffumata, Rubricosa, etc. *Desiderata.*—Numerous, in all stages.—*Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.*

CHANGE OF ADDRESS.—Mr. G. T. Lyle from "Sunthorpe," St. Georges Road, Wallington, to "Briarfield," Stump Cross, Halifax.

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, June 7th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—Ordinary Meetings, *Thursdays, June 8th and 22nd.* Field Meeting at Canvey Island, *Saturday, June 10th.*—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

CONTENTS.

Henry Rowland-Brown, 121. Two New Species of Far Eastern Rhopalocera, *Waro Nakahara, A.M., Ph.D.*, 123. Notes on British Odonata in 1921, *W. J. Lucas, B.A., F.E.S.*, 125. Rambles in South-Eastern France, *F. A. Oldaker, M.A., F.E.S.*, 127. Further Notes on *Sarrothripus revayana*, Scop., *W. G. Sheldon, F.Z.S., F.E.S.*, 131. A Synopsis of British Proctotrypidæ (Oxyura), *Claude Morley, F.E.S., F.Z.S. (continued from p. 110)*, 132.

NOTES AND OBSERVATIONS.—The Dipterous Family Blepharicæridæ, *T. D. A. Cockerell*, 135. *Vanessa antiopa* in Surrey, *F. W. Frohawk*, 136. *Vanessa c-album* in Bucks, *G. E. Tite*, 136. *Hippotion celerio* in Devonshire, *F. G. S. Bramwell*, 136. A Striped Hawk Moth (*H. celerio*), *R. M. Milne*, 136. *Vanessa io* ab. *belisaria*, *N. D. R.*, 136. Notes from Brockenhurst, *W. J. Lucas*, 136. *Pernoptilota fluviata* and other Captures in Westmorland, *Dr. Lowther*, 136. *Deiopeia pulchella* Bred from S. Devon larva, *J. M. Jaques*, 137. Occurrence of *Forficula auricularia*, Linn., var. *forcipata*, Steph. in Surrey, *G. Fox-Wilson*, 137. Rhopalocera from Rhodes, Samos, Gallipoli, etc., *E. B. C. Betts*, 137. Attractiveness of Light for Moths, *George Bolam*, 138. Flashlight Photography and Nature, *Charles P. Rimmer*, 139.

RECENT LITERATURE.—Index Animalium: 1801-1850, 139. Report of the Proceedings of the Fourth Entomological Meeting held at Pusa, February, 1921. The Scottish Naturalist, March to April, 1922, 140.

SOCIETIES.—The Entomological Society of London, 140. The South London Entomological Society, 140. South-West Yorkshire Entomological Society, 141.

OBITUARY, 142.

“ENTOMOLOGIST”

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1912, Vol. 45) at 15s. each; 1915 and 1916 at 10s. 6d.; 1917, 15s.; 1919, 19s. 6d.; 1920, 25s.; 1921, 25s. Carriage extra.

THE ‘ENTOMOLOGIST’ SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

Vol. LV.]

JULY, 1922.

[No. 710

THE
ENTOMOLOGIST

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH.

WITH THE ASSISTANCE

ROBERT ADKIN, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,
NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A. Large Stock of

British, Continental & Exotic Lepidoptera

and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

BIG BARGAIN IN SOUTH AMERICAN BUTTERFLIES.

Have just received a lot of Brilliant Tropical Butterflies that I can offer at £1 16s. per 100. Includes Papilio, Catagramma, Perisame, Batesea, Catopsilia, Heliconidæ, etc., not all perfect, but in good condition. Lyc. exilis at 18s. per 100. I also have Morpho rhetenor, sulkowski, cypris, menelaus, amathonte, etc., and a few ♀♀ of same. Send for Price List.

*Dealers or Collectors of Butterflies in India, Java, Oceania, etc.,
please send list of showy butterflies.*

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

Agent for HARBUTT'S THYMO=PLAS.

A mounting material for Entomologists and a perfect preservative for mounting insects. Booklet free on application. Introduced by Dr. ALFRED MOORE, F.E.S., and adopted by Professor LEFROY as the standard method for use in the Entomological Department, Royal College of Science, London.

Thymo-plas in 1-lb Cartons	2/6 per lb.	Gummed Paper Rolls, 1/2-in. wide	6d. each.
Celluloid Slides, No. 1, 2 x 1 in.	6/- per gross.	Thymo-plas Outfit, No. 1	3/-
" " No. 2, 3 x 1 in.	9/-	" " " " No. 2	6/-

Postage 1/-

LEONARD TATCHELL.

Entomologist,

**Send for lists of Cabinets,
Apparatus and Set Specimens.**

43 SPRATT HALL ROAD, WANSTEAD, LONDON, E. 11.

THE ENTOMOLOGIST.

VOL. LV.]

JULY, 1922.

[No. 710

BLASTOBASIS LIGNEA WLSM. (LEP.): A SPECIES NEW TO BRITAIN.

BY WM. MANSBRIDGE, F.E.S.

IN August, 1917, Mr. A. E. Wright captured at Grange-over-Sands, N. Lancashire, a few worn specimens of a Tineid moth and others again the following year. Various attempts were made to identify the species without success. The worn condition

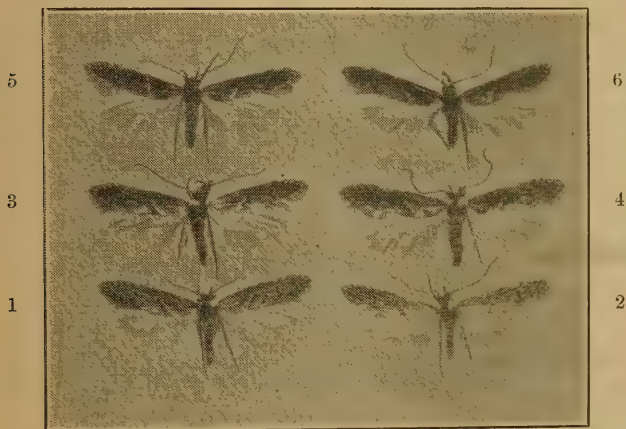


Photo. by Mr. Hugh Main.

Blastobasis lignea Wlsm. $\times 2$:—Figs. 1 and 2, typical; 3 and 4, intermediates;
5 and 6, var. *adustella* Wlsm.

of the specimens appeared at the time to be sufficient to account for the inability to determine the name of the moth. In 1919 and 1920 Mr. Wright was fortunate enough to meet with the insect in better condition and in larger numbers. A specimen was sent to Mr. F. N. Pierce, who reported that the genitalia were unknown to him. A larger amount of material now being available a series of the moth was sent to Mr. J. Hartley Durrant, who at once recognised it as *Blastobasis lignea* Wlsm.

The moth appears to be attached to the *Cotoneaster*, *Cotoneaster microphyllum* Wallich, but the association is not certain. The plant is freely cultivated as an ornamental shrub in N. Lancashire, and as an introduced alien is found wild at various places in the Lake District and in N. Wales. There is no

direct evidence yet available that *B. lignea* feeds upon the Cotton-easter; it has been beaten from that plant, but it also comes to the lamp, usually late at night.

When disturbed in the daytime the moth at once drops to the ground, and in the most lively fashion skates about on its back until it finds a crevice where it can conceal itself.

Working upon the supposition that *B. lignea* is a rubbish-feeder the mixture of dead leaves, fallen fruits, etc., from the Cotoneaster has been collected, and any larvae therein have been bred, but hitherto only Diptera have been obtained.

The above facts have been communicated to the writer by Mr. A. E. Wright, who is continuing his endeavours to elucidate the life-history of this addition to the British fauna; and for the following additional notes I am indebted to Mr. J. Hartley Durrant:—

In our lists *Blastobasis* should be placed before the *Oecophoridae*, and it should be noted that the inclusion of *Endrosis* in the *Blastobasidae* (as in Staudinger's Catalogue) is incorrect—*Endrosis* belongs to the *Oecophoridae*. As no full description of this latest addition to the British List has yet appeared in any readily accessible British publication I give below a copy of the original descriptions.

BLASTOBASIDAE.

BLASTOBASIS Z.

Blastobasis lignea Wlsm.

Wlsm. Tr. Ent. Soc. Lond., 1894. 550-1 (1894).

“*Antennae* pale greyish fuscous; basal joint enlarged, tufted and notched in the male, pale cinereous. *Palpi* pale cinereous, shaded and mottled with greyish fuscous externally. *Head* and *Thorax* pale cinereous, the latter shaded with greyish fuscous. *Forewings* pale cinereous, much shaded and speckled with greyish fuscous, with a slight purplish gloss; five small blackish spots (the first on the disc before the middle is sometimes connected with one on the middle of the fold below, and somewhat before it; a small one on the lower edge of the cell lies halfway between these and two spots, the one above the other, at the outer end of the cell); around the apex and apical margin is a series of six or eight ill-defined greyish fuscous spots along the base of the cilia, which are greyish cinereous, sometimes darker towards the apex. *Hindwings* very pale cinereous, with pale greyish cinereous cilia. *Abdomen* missing. *Legs* pale cinereous, somewhat speckled and shaded with greyish fuscous externally. *Exp. al.* ♂ 14, ♀ 19 mm.”

Type ♂ (13681); Type ♀ (13683); *CT.* ♂ (13682); *PTT.* (13684-96), **B.M.** (Mus. Wlsm.).

Hab. MADEIRA; sixteen specimens.

Blastobasis lignea Wlsm. + **adustella** Wlsm.

"In a single specimen the darker shading is more conspicuous, and the two inner spots are merged in an angulated fascia, leaving the dorsal margin at one-third and tending obliquely outwards to the disc before the middle, where it is angulated back towards the costa from what should be the position of the upper spot; but, before reaching the costa, it is again bent upwards and slightly outwards to the margin. Abdomen very pale cinereous, the segments marked by narrow greyish fuscous transverse lines. *Exp. al.* 19 mm."

Type ♀ (13697), **B.M.** (Mus. Wlsm.).

Hab. MADEIRA; one specimen.

"Intermediate varieties in which the fascia is slightly indicated appear to occur, but I have no specimens before me in condition for comparative description."

The capture of *Blastobasis lignea* Wlsm., in some numbers during the last few years by Mr. A. E. Wright, at Grange-over-Sands (Lancashire), is of extreme interest, as it adds not only a species, but a genus and also a family to our lists. I am not aware that, with the exception of Mr. Wright's specimens, this species has been taken anywhere but in Madeira. The first British specimens I saw belonged to the variety *adustella* Wlsm., and tended to confirm an opinion held by Lord Walsingham and myself, that the variety, founded on a single specimen, was probably distinct, but the receipt of other specimens from Grange-over-Sands showed that the species was even more variable than we had thought. The variety *adustella* is an extreme form, but the best one by which to remember the species. Variation from *adustella* takes place in the loss of the strong markings, such specimens being pale and inconspicuous; in the other direction a brownish suffusion produces *lignea*, and some specimens are very dark fuscous (Drnt.).

AN ENTOMOLOGICAL HOLIDAY IN S. FRANCE.

By K. G. BLAIR, B.Sc., F.E.S.

The insects here noted were collected in the course of a short holiday in the south of France, in May, 1921, in the company of Mr. Hugh Main. The prime object of our trip was the observation, and the photographing in their natural haunts, of the insects that form the subject of the late J. H. Fabre's fascinating series of "Souvenirs Entomologiques," especially of those that cannot be observed in this country. In the short time at our disposal we could not of course hope to discover anything like all of these, and the time of year chosen was too early for many of them, yet the exhaustion of Mr. Main's supply of plates and the running short of our stock of collecting boxes sufficiently demonstrate that we found a very satisfactory proportion of them. Many of the pictorial records of the trip, which were the work entirely of Mr. Main, were on view at the Exhibition of Nature

Photographs held at the rooms of the Royal Photographic Society in February last.

Our trip was divided into two portions—from the 7th to 15th May at Hyères, from which short excursions were made by road or rail to Carqueiranne to the west and Le Lavandou to the east; from the 17th to the 29th May at La Sainte Baume, a locality of which an excellent account from a butterfly-hunter's point of view by the late Rev. F. E. Lowe has already appeared in our pages ('Entom.' vol. xlvii, 1914, pp. 14–20, 60–63). Mr. Main had previously visited this locality in July, 1920, and an account supplementary to Mr. Lowe's is given by Mr. Bethune Baker, who was there at the same time, in 'Ent. Record,' 1921, pp. 101–105. This valley is about 2000 ft. above sea-level, and at the time of our visit the insects as well as the plants were found to be about three weeks later than the same species in the neighbourhood of Hyères.

Though collecting was not our prime object, and was not indeed attempted with any degree of thoroughness, yet a very fair bag was secured. As regards *Rhopalocera*, for example, series were not collected—merely a few samples of the different species noted. Although our stay was five weeks earlier than that of Mr. Lowe, and only half as long, the number of species we secured was exactly half the number recorded by him, viz. 37 compared with 74: Twenty-three of those found at Ste Baume were the same as noted by him, and the following mostly spring species were found in addition to those noted by either Mr. Lowe or Mr. Bethune Baker: *Thais medicicaste*, *Euchloë tagis*, *E. cardamines*, *E. euphenoides*, *Leptidea duponcheli*, *Melitaea aurinia*, *Nemeobius lucina*, *Everes argiades f. coretas*, *Lycaena sebrus*, *L. cyllarus*, *L. melanops*, *Nisoniades tages*, and *Hesperia sidae* (for these identifications I am indebted to Mr. Riley).

By a mere accident a method of sending these home was discovered that will perhaps repay further trial. The butterflies were papered in the usual way, ordinary newspaper being used, and the envelopes packed in tin boxes which had been moistened with glacial acetic acid, and, owing to corrosion, were useless for the living insects for which they were intended. For some weeks the butterflies remained limp and in perfect condition for setting, and showed no tendency to develop mould.

Of insects of other orders the following are perhaps of interest, the letters (H.) and (S.B.) after the name signifying Hyères and Ste Baume respectively.

Orthoptera.

FORFICULIDÆ.

Anisolabis moesta, Gén   (S.B.).

Forficula decipiens (H.).

„ *pubescens*, Gén   (H.).

BLATTIDÆ.

Ectobia albicincta, Br. (S.B.), ♀ ♀ and young.

„ *vittiventris*, Costa, 1 ♂ recently mature.

Loboptera decipiens, Germ. (H. and S.B.), in all stages, and by far the commonest species. All these and the Forficulidæ were found beneath stones.

MANTIDÆ.

Empusa egea, Charp. (H.), ♂ ♂ only and egg-cases; (S.B.) egg-cases only.

Mantis religiosa, L. (H.), young and egg-cases; (S.B.) egg-cases only.

The young *Mantis* and egg-cases of both species were brought home, but the former soon died, and the latter have completely failed to produce either young Mantids or parasites.

PHASMIDÆ.

Bacillus gallicus, Charp. (H.), young only, which fed up well on rose, all, as usual, turning out to be ♀. These only lived a few weeks, but have deposited a fair number of eggs.

GRYLLIDÆ.

Gryllus campestris, L. (H. and S.B.). Abundant everywhere, especially on the margins of cultivated ground. Their presence appeals, both by day and by night, very much more to the ear than to the eye—in fact it was not till we commenced systematically to search for them at Ste Baume that we actually found them at all. But once we had discovered their burrows it was easy to find as many as we required. The ♂ ♂ were much more numerous than the ♀ ♀, or at any rate appeared to be so, and many of the latter, when dug up, were found to be immature. They lived for some time in captivity, ovipositing freely in earth, but we were unsuccessful in rearing the young crickets above about 1 cm. in length.

G. desertus, Pall. (H.), 1 ♀.

G. burdigalensis, Latr. (H.), 1 ♂.

Gryllotalpa gryllotalpa, L. (H.), 1 immature specimen under a stone.

ACRIDIIDÆ.

Acridium aegyptium, L. (H.). The ♀ was much more common than the ♂. On seeing this huge insect start from a low bush just in front of one and settle in a cork-oak a few yards away, it was difficult to believe that it was not a bird.

Odonata.

Crocothemis erythrea, Br., *Sympetrum striolatum*, *Aeschna mixta*, *Brachytron hafniense*, *Calopteryx haemorrhoidalis*, *Lestes barbarus*, *Sympycna fusca*, *Pyrrhosoma nymphula*, *Agrion mercuriale*, *A. puella*.

All these were taken on a single day at Hyères Plage, and that only in the afternoon when our time was getting very short. To British collectors it appeared strange to find *Sympetrum striolatum* and *Aeschna mixta* in mid May; *Sympycna fusca* is well known to hibernate, and the single ♀ found is obviously not freshly emerged. For the identifications I am indebted to Mr. H. Campion.

Neuroptera.

ASCALAPHIDÆ.

Ascalaphus longicornis (H. and S.B.).

A. libelluloides (S.B.).

On this occasion *A. longicornis* was found only at Hyères, but it was taken by Mr. Main at Ste Baume in July, 1920. A long search for the larvæ under stones at both places (a search encouraged by each of us finding one, and one only), and that in spots where the adults were common, appears to demonstrate that though the larvæ may occasionally be found in these situations such are not their *usual* haunts. Unfortunately, though one of the larvæ moulted once, we could not get them to feed properly and both died.

MYRMELEONIDÆ.

Myrmeleon formicarius (H. and S.B.), larvæ only.

The well-known pits of these insects were found in plenty in both localities, sometimes on sheltered ledges of rock faces, sometimes on open stretches of sand, even on the sea-shore. It is not certain that these were all of one species, as unfortunately the larvæ were not kept distinct. The only flies to emerge in August were of this species.

Palpares libelluloides (H.). Larvæ only. These were found in some numbers on the landward side of a low ridge of sandhills bordering the sea. They form no pit-like *Myrmeleon*, and the only sign of their presence was a few dead beetles and other insects on the sand. On running the hand over the surface of the sand, immediately beneath which they lie, the larvæ, large and small, were easily turned out and discovered. No flies emerged during the summer, and no cocoons were formed, though the larvæ fed well until the autumn. During the winter they have been kept in an unheated room and not fed at all. A few have died, but

most are still (April 2nd) alive though very sluggish. Mr. Main had taken the flies in the Ste Baume neighbourhood in the previous July, but a long search on the few bare sandy patches at that spot failed to produce any more larvæ.

SIALIDÆ.

Sialis fuliginosa (S.B.). A single specimen.

CHRYSOPIDÆ.

Chrysopa vulgaris (S.B.)

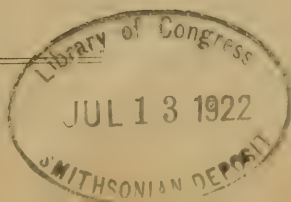
C. prasina (H. and S.B.).

Of **Coleoptera** about 300 species were taken—a list far too long to be inserted here. Of these over 180 were taken at Hyères, while only 38 were found common to both places—figures which indicate the strong Mediterranean element in the coastal fauna. Of this total 104 species find a place on the British list.

Particularly interesting were the sea-shore species, the giant *Scarites*, *Pimelia bipunctata*, *Tentyria mucronata*, *Formicomus pedestris*, etc. The flowers of *Cistus* on the hillsides were very prolific, *Bruchidæ* being represented by 13 species, *Oedemera* by 7, *Mycterus curculionoides*, various *Dasytids*, *Cetoniids*, etc., while the flowering oaks and pines were sometimes swarming with *Omophlus*; At Ste Baume on the other hand the distinctive feature compared with Hyères was given by those groups with wood-boring larvæ, *e.g.* Longicorns with 11 species as against 7 at Hyères, *Buprestidæ* with 6 species against 2 at Hyères, *Scolytidæ* with 5 species to none at Hyères, and so forth.

For the **Hymenoptera**, to which so much attention was devoted by Fabre, we were too early, though about fifty species were captured, including the fine *Xylocopa violacea* and *X. cyanescens*, while *Chalicodoma muraria* was nidifying in plenty on the walls.

Enough has perhaps been said to give an idea of the possibilities of the district to those of us in search of pastures new. The attractions of collecting on the Continent have long been realised by our lepidopterists (I should perhaps say our rhopalocerists!), but as regards other orders, except for a very limited number of coleopterists, the Continent is indeed to British entomologists a *terra incognita*. Signs, however, are not wanting that interest in the Continental fauna is now waking, thanks chiefly to the English translations of Fabre's accounts of his beloved insects.



A NEW SPECIES OF *EXILLIS*, A GENUS OF ANTHRIBIDÆ (COL.).

BY DR. K. JORDAN.

THE Entomologist to the Board of Commissioners of Agriculture and Forestry at Honolulu, D. T. Fullaway, has sent to me for identification a small species of Anthribid belonging to the oriental genus *Exillis*. It is a new species, which can be recognised among the other species (mostly undescribed as yet) by the following particulars:

Exillis lepidus, nov. spec.

Proboscis and head coarsely rugate-reticulate, the former with a short and deep median groove; frons without carinæ. Eye moderately convex. Angle of pronotal carina rounded off. Elytra rather coarsely punctate-striate, with the interstices convex.

Rufescent brown, densely covered with a creamy grey pubescence; no markings below, but the upperside variegated with ill-defined and variable dark brown spots: two on occiput, one in centre of pronotum, and several, more or less confluent and large, on sides of disc, a spot near base of each elytrum, a large one in middle, usually oblique, continued sideways and forming a kind of interrupted band, a patch or a network of spots at the beginning of the apical declivity, and in most specimens a small spot at the apex. Antenna blackish, segments 1, 2 and half 3 like the legs pale rufous, tarsal segments 2 to 4, apex of 1 and extreme tip of tibiæ dark brown.

Length: 2.2-2.5 mm.

A small series of both sexes from Oahu, collected by D. T. Fullaway in July, 1921.

NOTES ON BRITISH ODONATA IN 1921.

BY W. J. LUCAS, B.A., F.E.S.

(Continued from p. 127.)

In addition to these notes of my own I have received several interesting communications from other Entomologists who devote some attention to our dragonflies.

K. G. BLAIR reports that from 1-12 July *Ischnura elegans* Vanderl., *Pyrrhosoma nymphula*, Sulz. (with its var. *melanotum*, Selys), were found at the Curragh, Isle of Man. On 28 Aug. *Aeschna grandis*, Linn., and *Ae. cyanea*, Müll., were met with at Stanmore Common, Middx.

F. H. HAINES, writing 18 Aug., says: "I went again yesterday to the Morden pond to try to get some fresh specimens of *Sympetrum fonscolombii*, Selys. As I feared, the insect was over, I had been once or twice at the beginning of this month without success. I would not be quite certain that one specimen did not

present itself, but *S. striolatum*, Charp., had appeared in some numbers to complicate observation as regards at least the females. This latter species was quite absent when I was there in July. So my captures for this season stand at the single male and female quoted in the 'Entomologist.' The females were, if present, elusive. The one secured is redder, and not so teneral-looking as those I took in 1912, 13, and 14. The West Knighton Heath pond has quite dried up, most unfortunately. The Morden pond is very low comparatively, but it is a big one. Yet the nymphs, if present, must have a bad time from the very numerous birds. As regards the non-appearance of *S. fonscolombii* this month, I may point out that every time I have gone the weather has been unfavourable—windy and cloudy, if not rainy, though yesterday was better."

R. SOUTH captured: *Calopteryx splendens*, Harris, at Rickmansworth Canal, Herts, on 1 June; *Calopteryx virgo*, Linn., at Padworth, Berks, from 12–14 June,—one full-coloured male, one male perhaps var. *anceps*, Steph., and one female with rather narrow wings; *Ischnura elegans*, Vanderl., *Pyrrhosoma nymphula*, Sulz., and *Enallagma cyathigerum*, Charp., also at Padworth from 12–14 June.

A. RANDELL JACKSON reports: *Ae. cyanea*, Müll., *A. imperator*, Leach, *C. annulatus*, Latr., *C. aenea*, Linn., *L. depressa*, Linn., *O. caerulea*, Fabr., *C. virgo*, Linn., *I. elegans*, Vanderl., *A. puella*, Linn., *P. nymphula*, Salz., and *E. cyathigerum*, Charp., at Ashdown Forest, Sussex, in June. In Delamere, etc., Cheshire, in 1921 early things were numerous, but the later ones—presumably affected by the drought—were rarer than usual. *Leucorrhinia dubia*, Vanderl., and *C. aenea*, Linn. were common in Delamere and he got a few *Erythromma najas*, Hans., in early June. He saw a pair of what he was sure were *Brachytron pratense*, Müll., in a lane near Chester at the end of May. As it would be new to the county list he hopes to get it in 1922. *Agrion pulchellum*, Vanderl., was absent from the place where it occurred in 1920.

F. J. KILLINGTON writes 14 Jan., 1922: The year as a whole has been the most disappointing one for Odonata that I have experienced. Even so I was astonished at the number of imagines that did get through considering that most of our local ponds dried up completely (*i.e.* near Eastleigh, Hants), yet later a fair number of such things as *Ae. cyanea*, Müll., appeared. *A. mercuriale*, Charp., did not occur in abundance but of those taken a fair percentage had aberrant markings on the 2nd segment. I did not notice any imagines after June. *A. puella*, Linn., *A. pulchellum*, Vanderl. (scarce), *P. nymphula*, Sulz., *I. elegans*, Vanderl., *C. virgo*, Linn., and *C. splendens*, Harris, were all in evidence at the beginning of the season, but seemed to disappear quickly. I came across one specimen only of *Lestes*

sponsa, Hans., on a dry pond bed (30 July). *E. cyathigerum*, Charp., swarmed on the open clear sheets of water around Southampton from spring until the end of September. Early in the last named month (1st to 3rd) I took teneral specimens of this species. On 21 May I came across *C. aenea*, Linn., here—a species I had previously overlooked in this neighbourhood.”

H. SLATER, writing 18 Sept., 1921, tells me that—Capt. Troup brought him (on 11 July) from Maiden Down near Burlescombe (N. Devon) the only little blue dragonfly he saw. It was *A. mercuriale*, Charp., and a record for Devon. He goes on to say: “He and I worked, a fortnight later, other parts of the Blackdown Hills (where *Orthetrum caerulescens*, Fabr., is endemic, but not found, as far as I know, elsewhere in the county). Again we met with one only little blue, and it was again a male of *A. mercuriale*—this time in Somerset. I expect I shall find it all along the hills, on which are healthy and sphagnous bogs, constituting our boundaries with Devon.”

E. A. C. STOWELL informs me that: “Of the less common species the most generally distributed in our woods (*sc.* near Alton) seems to be *C. aenea*, Linn., which I have found in Alice Holt and Binswood (both clay with oak) and Headley Park (sand with fir and birch). I caught *A. imperator*, Leach, at Kingsley pond—an open heath pond with no trees or bushes near. This pond was nearly dry in October and ducks were evidently making havoc of surviving naiads. Both Oakhanger ponds have also gone stone dry. *Pyrrhosoma tenellum*, Vill., was taken on 24 Aug. at a pond in Cranmer Bottom, Woolmer Forest. It was not a very bright day, and it was sitting on the vegetation beside the pond, which is a long one with poor pines growing in bog at one side and open heath on the other. The specimen I took was a male. There was no abundance of them, and when I went again in September there were none to be seen. I noted—*C. virgo*, Linn., 14 May, Bentley; *C. aenea*, Linn., *L. depressa*, Linn., and *P. nymphula*, Sulz., on 20 May, the first in fir-wood at Headley Park, the other two at Kingsley; *A. puella*, Linn., *E. cyathigerum*, Charp., *P. nymphula*, Sulz., and *L. quadrimaculata*, Linn., on 22 May at Oakhanger; *A. imperator*, Leach, on 2 July at Kingsley; *P. tenellum*, Vill., *S. scoticum*, Don., *L. sponsa*, Hans., and *E. cyathigerum*, Charp., (the last with strangely aberrant marking on abdomen) on 24 August at Cranmer Bottom.

There seems to be no doubt that the drought affected adversely the dragonflies in the latter part of the season, reducing their numbers and causing their periods to pass by rapidly. Its effect in the present season will be watched with interest by students of our Odonata.

28, Knight's Park,

Kingston-on-Thames;

April, 1922.

COLLECTING IN 1920 IN GLOUCESTERSHIRE,
NORTH WALES, ETC.

BY C. GRANVILLE CLUTTERBUCK, F.E.S.

I WAS too busy in the spring to do much, added to which Easter in Gloucester was a complete "washout," four days of almost continuous rain rendering field work impossible. My first good day was May 3rd, when in company with Capt. G. H. Simpson-Hayward we found *Crambus chrysonuchellus* on the Cotswolds for the first time, and also larvæ of *Geometra papilionaria* by searching the young birches. The latter were mostly stung but some fine specimens were bred. The afternoon of June 2nd was spent in Leigh Woods with Mr. G. C. Griffiths and Mr. A. E. Hudd. The latter took a specimen of *Phalonia nana* in his Diptera net and kindly gave it to me. Amongst others I secured *Alucita osteodactyla* amongst Golden Rod and *Argyresthia illuminatella* amongst larch, both for the first time. June 13th found me on our hills, when *Lycaena arion* was observed in a new locality which, on the 18th, produced specimens of *Gelechia plantaginella*—a new record for Gloucestershire. They were taken at rest on stones scattered about in a hilly field. The 24th was a fine, warm day, and whilst I was taking *Evetria pinivorana* by beating Scot's firs, two visitors, Capt. Tebb and Mr. J. J. Lister, were taking *L. arion* in yet another locality. The weather during the last week in June and practically the whole of July was most disappointing, villainously cold, wet and windy, and made collecting micros practically impossible. However, on July 9th I realised one of my ambitions by discovering a locality for our rarest local orchid, the Red Helleborine (*Cephalanthra rubra*). The same day *Æcophora lunaris* and *Cedestis farniatella* were observed at rest on a neighbouring fence. Having arranged to visit Towyn in North Wales from July 27th to August 18th, I wrote to Mr. H. Rowland-Brown and Mr. W. Mansbridge for information as to the district, which they kindly supplied. The former said he had supplied specimens of *Papilio machaon* to Dr. Jackson of Aberdoverly to try planting them out and suggested that I should inquire as to the result of the experiment. I learnt from Mr. Jackson that the species entirely failed to establish itself. Going through his collection I noticed a specimen of *Deilephila lineata* (*livornica*), which he had taken locally in May, 1912, at flowers of *Silene maritima*. He also had specimens of *Zephyrus betulae* and *Coenonympha tiphon* taken in the district. He told me that the larvæ of *Cucullia asteris* were to be found on Golden Rod in September on the mountain at the back of his house. Personally I was disappointed with the district. The first week at Towyn was spoilt by the wet and windy weather.

On July 29th I cycled to Talylyn (ten miles), left my machine at a farm house and started to climb Cader Idris (2920 feet). There was a cloud over the peak, but in my inexperience I disregarded it, to my cost. The path leading from the road through a belt of scrub oak was covered with loose pieces of slate, rather trying to one's boots, and beating the oaks only produced *Eucosma arcuella* and *Gracilaria alchimiella* (*swederella*). On emerging from the tree belt I netted a dipteran, which has been kindly identified by Mr. Claude Morley, F.E.S., as *Theriopectes distinguendus*, Verr., and then went through a farmyard, where the farmer's wife obligingly directed me to the best way up the mountain. On the way up I netted two specimens of *Coenonympha pamphilus* in the hope that they were *C. tiphon*. The west wind from the sea made a net practically useless had there been anything to catch, but only a larva of *Eriogaster rubi* was observed sunning itself on a stone amongst whortleberry. When 2000 feet up I had a glorious view of Snowdonia. A little further on I was swallowed up in the mist but nevertheless proceeded to the summit, where I was just able to look down the precipice into the tarn called Llyn Cau. On the return journey on the roadside at the foot of the mountain I noticed a nest of *Vanessa io* larvæ about three-quarter grown feeding on the nettles. August 2nd being fine we walked to the Bird Rock, a mountain rising 1000 feet sheer out of the valley, the home of the cormorant and other sea birds, but the only species noted worth mentioning was *Endotricha flammealis*. To visit Mr. D. A. Jones, M.Sc., of Harlech, twenty-three miles away, I cycled through Barmouth on the 5th. Just before I came in sight of the picturesque ruins of Harlech Castle a freshly emerged ♂ *Gonodontis elinguaris* was boxed from a telegraph post. *Tephroclystis subfulvata* and *T. nanata* were boxed from a fence near Barmouth. Next day on the way to Owen Glendower's Cave at Tonfanan a burying beetle, *Necrophorus rustator*, was noticed at work on a dead Meadow Pipit. A solitary *Polyommatus icarus* was seen on the sandhills of Aberdoverly on the 7th, and a green bottle fly was found impaled on a spike of marram grass. On the railway bank adjoining the sands of Towyn, where the seaside Everlasting Pea (*Lathyrus maritimus*) was growing, *Hipparchia semele*, *Chrysophanus phlaeas*, *Plemyria galiata*, *Zygæna filipendulae*, *Eucosma cespitana*, *Tortrix conspersana* and *Anacamptis taeniolella* were taken. Other captures included *Opostega salaciella* (on some iron railings near the shore on the 13th) *Lithocolletis alnifoliella* and *Ochsenheimeria birdella*. My wife found a larva of *Notodonta ziczac* on poplar on the 9th. On the 11th I cycled to Dolgelly. My only capture there was *Scoparia ambigualis*. On the 15th *O. birdella* ♂ was observed at rest on a gate-post on the local marshes where *Juncus acutus* was growing, and also a worn pair of *Zygænas in cop.* on flowers

of Ragged Robin, which have been since kindly identified by the late Mr. Rowland-Brown as *Z. trifolii*. We returned home on the 18th.

From larva feeding in purses at the end of osier leaves picked in our beds in September I reared a few specimens of *Gracilaria stigmatella* and its ichneumon, *Angitia virginalis*, Grav. The latter was kindly identified by Mr. Morley. I beat out a ♂ *Exapate congelatella* from a hedge near here for the first time on October 14th. *Tephroclystis pulchellata* began emerging on June 4th, 1921, from pupæ brought from Towyn. In conclusion my thanks are due to Mr. E. Meyrick, F.R.S., for identifying most of the micros.

23, Heathville Road,
Gloucester;
June 10th, 1921.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

By CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 135.)

16. PROCTOTRYPES HYALINIPENNIS, sp. nov.

A black and finely pubescent species; tegulæ, base of flagellum obscurely, and the legs except basally, clear red. Superficially very like the last species, but abundantly distinct in its longer head, short, stout and filiform flagellum, whereof the joints are parallel-sided, and nearly truncate at both extremities, with the seventh to twelfth but slightly longer than broad, the radial appendix is wanting, the metathorax is shorter and apically less attenuate, with its disc less smooth; the abdomen is slightly, and the legs very distinctly shorter, with the terebra very nearly straight. The orbicular head is not at all broader than long in ♀ and but slightly so in ♂, and resembles that of *F. claripes*, Thoms., but the short metathorax with its finely sculptured disc, and the equally long third and thirteenth antennal joints, render it distinct. In the ♂ the flagellum is more slender than in ♀, though its joints are equally cylindrical and truncate. Length $3\frac{3}{4}$ –5 mm. ♂ ♀.

Types of sexes in author's collection.

Doubtless a winter species, since of my single pair, the female was swept from thistles (*Cnicus palustris*), in marshy ground at Bentley Woods so late in the year as November 16th, 1895, and Mr. W. H. Tuck kindly sent me the male, taken by him during May, 1899, at Tostock, in Suffolk.

17. PROCTOTRYPES MICRURUS, Kieff.

Serphus micrurus, Kieff, in André, Spp. Hym. Eur., x, p. 312.

Hitherto known from only Portugal and France. I am enabled to introduce this species as British on the strength of three females taken by me on October 2nd, from the inside of a dead rabbit at Bentley woods, near Ipswich; another captured with these is now lost. All four were probably no more than sheltering here from the weather, since with them were no insects but the Braconid, *Meteorus filator*, Hal. (cf. 'Entom.,' 1908, p. 150), a Lepidopterous parasite.

18. PROCTOTRYPES VIATOR, Hal.

Proctotrupes viator, Hal., l.c., p. 12. ♂ ♀; Voll., l.c., p. 31, pl. xix, fig. 7, ♀. *Serphus viator*, André, l.c., p. 311.

Southern and western Europe from the Crimea to France, from May to September. Common in woods in both Ireland and England, though less frequent than *P. pallidipes* (Haliday and Walker), Scotland (Cameron). We have nothing published respecting its economy but Curtis' two records: he says ('Farm Insects,' p. 198) "that on opening the cells of the specimens of this beetle [*Nebria brevicollis*, Fab.] I found them partly consumed, and the other had produced six specimens of *P. viator* (?), thus showing that this parasite keeps in check . . . the larvæ of ground beetles." Kieffer omits the query, carefully perpetuated by van Vollenhoven, whom he obviously copies, for he omits Curtis' more certain record from another ground beetle, *Pterostichus vulgaris*, Linn. (*lib. cit.*, p. 131), thus: the larvæ of *Omaseus melanarius* are "frequently infested by a parasite called *P. viator*." It is remarkable that entomologists nowadays ascribe the host to the Staphylinidæ; thus Edward Step sent me four bred in 1909 "from *Creophilus maxillosus*" at Worcester Park in Surrey; K. G. Blair gave me three bred at the end of April, 1913, "from *Ocypus olens*" larva at Eastbourne in Sussex, and Dr. T. A. Chapman was interested in an "*Ocypus olens*" larva found at Reigate, in Surrey. I have recorded ('Trans. Entom. Soc.,' 1907, p. 9) the occurrence of a similar larva in my Monks Soham garden. A later record is that of a "*Coleopterous larva*" dug up in a garden at Skegby in Notts during July, 1917, whence two imagines emerged the same month. Charles Nicholson, in 1918, met with two instances of "*Coleopterous larvæ*," dug up in a Walthamstow garden, each producing about fifteen of these parasites. It is more than probable that Frohawk's record ('Entom.,' 1886, p. 225) also refers to the present species, since *Exallonyx ater* has hitherto been so little understood. *P. viator* is everywhere common, and I have records from Suffolk, Wiltshire, Hampshire, etc., up to Banchory in the Kincardine highlands of Scotland, where Elliott found it not uncommonly.

19. PROCTOTRYPES CHITII, sp. nov.

A shining species with the frons normal, metathorax except basally scabriculous, terebra hooked and a dark spot below the alar stigma; abdomen oblong and apically subtruncate. Similar to *P. viator* in its wings, centrally unicarinate and laterally mutic metathorax, red legs with all onychii nigrescent, deplanate frons and subdistinct discal nervures, but very different in having the radial cell so short as to be hardly distinct from the stigma, head buccate and in ♀ but slightly broader than long, all the coxæ red, disc of metathorax subtriangularly nitidulous to its base with this area weakly circumcarinate, and remainder of metathorax more finely rugulose; second segment basally less compressed with more feeble striæ, terebra longer and stout, strongly arcuate, much longer than metatarsus, and as long as half segment; legs also very much longer, and the hind ones nearly double abdominal length, all the onychii and onyches of ♀ black with the anterior distinctly explanate though simple. Length 5 mm. ♂ ♀.

Types of sexes in author's collection.

The late Arthur John Chitty, M.A., recognised this species as undescribed when working through the genus in 1907, and had distinguished it by a MS. name. It is peculiarly his, since he captured the unique female near his country house at Huntingfield, in Kent, on September 2nd, 1905, and the male in the same district of Faversham on October 8th, 1906. I here do myself the honour of perpetuating the memory of a most brilliant entomologist and intimate friend.

EXALLONYX, Kieffer.

Bull. Soc. Hist. Nat. Metz, xi, 1904, p. 34.

This genus differs from the subgenus *Phænoserphus* of *Proctotrypes* in little but the explanate anterior onychii and their remarkably trifid onyches. Eighteen palæarctic species and some from America were known in 1908.

TABLE OF SPECIES.

- | | | |
|-------|----|--|
| (16). | 1. | Radial cell at most half length of the normal stigma. |
| (15). | 2. | Second, large abdominal segment basally striate. |
| (8). | 3. | Frons deplanate, not elevated above antennal insertion. |
| (7). | 4. | Metathorax discally smoother; antennæ mainly nigrescent. |
| (6). | 5. | Antennæ of ♀ slender, reaching to abdominal centre. |
| | | 1. <i>longicornis</i> , Nees. |
| (5). | 6. | Antennæ of ♀ stout, not reaching beyond thoracic apex. |
| | | 2. <i>brevicornis</i> , Hal. |
| (4). | 7. | Metathorax reticulate throughout; antennæ flavous. |
| | | 3. <i>xanthocerus</i> , Kieff. |

the solitary female I have examined was captured on July 28th, 1917, by Prof. J. W. Carr, at Lambley, near Nottingham.

3. *EXALLONYX XANTHOCERUS*, Kieff.

Exallonyx xanthocerus, André, Spp. Hym. Europ., x, 1907, p. 332, ♀.

Head transverse, but not twice as broad as long; frons deplanate; mandibles and palpi flavidous. Antennæ unicolorous bright flavous throughout, as long as head and thorax; flagellum of ♀ slender with exactly cylindrical joints, of ♂ somewhat stout and apically attenuate; in both sexes the third joint slightly longer than the stout scape and twice as long as broad, the penultimate half as long again as broad and a little shorter than the apical joint. Thorax nitidulous; pronotum laterally tuberculate; metathorax gradually declived, evenly reticulate to base and longitudinally unicarinate throughout. Abdomen with the ♀ segments three to six brunneous; petiole transverse, and like base of second segment, striate; terebra arcuate and a fourth of second segment, or three-fourths of metatarsis, in length. Legs slender and clear flavous, with only the claws and base of ♂ hind coxæ infuscate; the large hind calcar one-third of the metatarsal length. Wings hyaline, tegulæ flavous; stigma semicircular and double length of radial cell; discal nervures wanting. Length 3·5–4 $\frac{3}{4}$ mm. ♂ ♀.

The male has not before been recognised, and the female was described from Italy. But these insects have been so little worked that it is not very surprising to find this species in southern England; it is doubtless rare with us and cannot extend far north, as it is unknown in Suffolk. I had the good fortune to beat a single male from oak-boughs in the Wilverley Inclosure of the New Forest on July 11th, 1909. The orange antennæ render it extremely conspicuous.

(To be continued.)

NOTES AND OBSERVATIONS.

H. ROWLAND-BROWN: A CORRECTION.—On page 122 of the present volume the statement is made that the late Mr. Rowland-Brown had bequeathed his collections and library to the Entomological Society of London, with remainder to the Hope Museum, Oxford. This statement, for which I was not responsible, although made on the best authority, is incorrect. Mr. Rowland-Brown's bequest is actually as follows: Such books in his library as the Entomological Society of London does not possess sufficient copies of are bequeathed to it; with the remainder of the books and the whole of his collections to the Hope Museum, Oxford.—W. G. SHELDON.

COLIAS CROCEUS (EDUSA) IN SURREY.—While hunting for Odonata to-day I caught a female of *C. croceus*. It is in good condition and was flying over a piece of marshy land.—BARON BONCK, F.E.S.; Springfield, South Godstone, Surrey, June 6th, 1922.

COLIAS CROCEUS IN SURREY.—It may be of interest to record that on June 3rd, at Dorking, I saw seven specimens of *Colias croceus*, four of which were taken, including one ♀ from which a few eggs were obtained.—T. H. L. GROSVENOR; Gloucester Road, Redhill.

PYRAMEIS CARDUI AND COLIAS CROCEUS (EDUSA) ON THE SUSSEX COAST.—On the morning of May 24th several specimens of *Pyrameis cardui* were seen flitting about the flowery banks that border the western parades on the sea-front of this town. On the 25th they were still more commonly met with in the same place, and on this occasion were accompanied by a *Colias croceus*. I had not previously noticed either species in this neighbourhood this year, although an almost daily look-out is kept for anything that may come along, nor have I seen either species there since, but I hear that *P. cardui* turned up about this date in the woods a few miles inland.—ROBERT ADKIN; Eastbourne, June 8th, 1922.

COLIAS CROCEUS, ETC., IN SUSSEX.—I have seen this month *Colias croceus* and a number of *P. cardui*, and also on the 30th I took *Heliothes peltigera*.—J. E. CAMPBELL-TAYLOR; Southdown Villa, St. Anne's Crescent, Lewes, Sussex, May 31st, 1922.

COLIAS CROCEUS AND VANESSA ATALANTA IN THE ISLE OF WIGHT.—Yesterday, May 24th, I saw near Alum Bay in the Isle of Wight a *Colias croceus* flying rapidly over the downs, and during the same afternoon, near the same place, I also saw a *Vanessa atalanta*. The day was warm and sunny with a light air from the south-east. *Euchloë cardamines* was very late in emerging this year in the Bournemouth district, the first noticed by me—a ♂—appearing in my garden on May 20th.—A. L. RAYWARD; Durdells, Kinson, near Bournemouth.

COLIAS CROCEUS IN WILTSHIRE.—Several specimens of this species have been seen here during the last week.—A. P. G. MICHELMORE; Marlborough College, Wilts, June 4th, 1922.

COLIAS CROCEUS IN DEVONSHIRE.—I am able to report the occurrence of this species both in North and South Devon last week, on May 25th. I have not seen either myself nor were the specimens captured, but my informants were in both cases reliable. Are we going to have another "*croceus*" year at last?—MISS HINCHLIFF; Worthington House, Instow, N. Devon, May 28th, 1922.

COLIAS CROCEUS (EDUSA) IN S. DEVON.—It may be interesting to record the appearance of *Colias croceus* along the South Devon coast near the mouth of the Erme on May 22nd, 1922. On this date I took the female form *helice*, and saw one male. From May 22nd to present date I have seen, in the Yealmpton district, 7 others, 2 females and 5 males, all in perfect condition.—S. T. STIDSTON, R.N.; Revelstoke Villa, Torre, Yealmpton.

COLIAS CROCEUS IN CHESHIRE.—On May 28th, within a mile of the city of Chester, a specimen of this insect was captured by Mr. P. G. Nagle, of Chester, who also saw three other specimens on the same day in the same district.—ALFRED NEWSTEAD; Grosvenor Museum, Chester.

MANDUCA ATROPOS IN S. DEVON.—On May 18th, 1922, a worn and damaged specimen of *Manduca atropos* was taken on the foot-board of a local train at Millbay Station, Plymouth. It was sent to me by a student at Plympton Grammar School called Reginald Linton.—S. T. STIDSTON, R.N.; Revelstoke Villa, Torre, Yealmpton.

PHRYXUS LIVORNICA AT MERTON, SURREY.—A specimen of this species was found at rest by a neighbour of mine on May 15th at 9 a.m. and brought me alive on that date.—F. J. COULSON; 17, Bird-hirst Rd., Merton, S.W.

PHRYXUS LIVORNICA IN WARWICK.—A specimen of *Phryxus livornica*, in good condition, was captured in a garden here on Saturday (May 27th); it is now in my possession. It was at mid-day, and the insect was found hovering over some bluebells.—J. R. SLEATH; 2, Swan Street, Warwick.

PHRYXUS LIVORNICA (?) AT CARDIFF.—While weeding in my garden this evening about 9.15 I saw either a striped or silver-striped hawk moth hovering over some iris and stocks quite close to me.—W. E. R. ALLEN; Fairwell, Llandaff, Cardiff, May 20th, 1922.

SUGARING RESULTS IN 1921 AND 1922.—It is interesting to note the difference in results at sugar this year as compared with last year. On the night of June 10th, 1922, I sugared about 30 trees round the garden. At 10.30 p.m. (sun time) the best patch was visited by 106 moths, next best 95, and many had over 70. The bulk were *G. trilinea* and *A. exclamationis*. Also common were *X. monoglypha*, *T. pronuba*, *M. strigilis* and *fasciuncula*. In smaller numbers were *A. corticea*, *segetum* and *puta*, *N. c-nigrum*, *A. nebulosa*, *A. basilinea*, *X. hepatica*, *P. meticulosa*, *R. tenebrosa*, *L. comma*, *A. psi*, and single specimens of *C. or.*, *C. ocularis*, *T. batis* and *A. ligustri*. On June 14th, 1921, the note in my diary reads: "Sugar, nil. Not surprising, as every leaf is covered with honey-dew." Yet in this year, also a dry one, there is no honey-dew, and moths in consequence are swarming to sugar.—H. C. JEDDERE-FISHER; Apsleytown, Dormansland, June 11th, 1922.

THE COCOONS OF TELEA POLYPHEMUS.—The article by Mr. Geo. Griffiths (*antea*, pp. 38–39) was very interesting to me, as for several seasons I have kept numbers of these cocoons, obtained both through rearing the larvæ and by looking for them in the fall, through our long winters and in the spring. The diversity of method in making the cocoons, their outward appearance, the situations in which they are found and the probable explanation of them make careful and extended observations necessary. Not only is there a difference between the usual method of attachment in Canada and in Florida, but there is a type of cocoon prevalent through the Laurentian mountains, about 60 miles to the north of us, entirely different from any that we find about Montreal. We had hoped

to study this further during last summer but the continued hot dry weather was seemingly disastrous to *T. polyphemus*, for not a larva was seen, but in order to learn what others had recorded about this beautiful moth, notes were made of all the articles available to me, so perhaps the following references to cocoon-making may be of interest:

The first note is in Abbot and Smith's 'Nat. Hist. of the Rarer Lepidoptera of Georgia,' p. 93 (1797), in which we read: "It attaches its web to the underside of a leaf, taking care to spin round the stalk of the leaf and part of the twig, by which means the chrysalis is kept from falling off during winter." Fitch—'Third Report, Noxious and other Insects of N.Y.,' No. 181, p. 455, 1856—says: "It sometimes attaches its cocoon partly to the side of a limb, or sometimes with its silken thread draws two or three twigs together sufficiently to tie its cocoon between them, in which case it does not fall to the earth with the fall of the leaves in the autumn, but it is very apt, by remaining exposed in the tree, to be perforated and have its inmate destroyed by woodpeckers." Riley—'Fourth Missouri Report,' p. 126, 1872—"The cocoon . . . generally attached to a leaf or leaves, with which it falls to the ground, though sometimes it is fastened to twigs and therefore remains exposed during the winter to its enemies." Since the article by Grote (1895) referred to, Daggett—'Entom. News,' vol. x, p. 204, 1899—speaks of *T. polyphemus* cocoons in California as "being closely woven the full length of the stem, and including the twigs adjoining, these being permanently attached to the tree" in contra-distinction to those he was familiar with in the East, in which no attempt was made to fasten them to the twigs and which readily fall to the ground. In 'Can. Entom.,' vol. xxxv, p. 110, 1903, Grote refers to having recorded in 'Proc. Am. Philos. Soc.,' vol. xii, p. 401, 1902, "an instance of the spinning of a silken attachment around the stem of the enveloping leaf in the cocoon of *Telea polyphemus*, reminding us of the habit of *Phyllosamia cynthia* or even perhaps of *Antherea mylitta*" and then adds that he has found three more examples of this hitherto unnoticed habit. To this Cockle replied ('Can. Entom.,' vol. xxxv, p. 139, 1903) that this was the rule and not the exception at Kaslo, British Columbia, and further, in vol. xxxvi, p. 100, 1904, quotes Denney that in Montreal "in some seasons 19 out of 20 are firmly attached to the twig." Webster ('Can. Entom.,' vol. xxxvi, p. 133, 1904), suggested the possible interrelation of attacks by woodpeckers and the method of attaching cocoons, and in a supplementary note on p. 336 refers to an article by Davis in 'Journ. N.Y. Ent. Soc.,' vol. v, pp. 42-43. Foster ('Can. Entom.,' vol. xxxvi, p. 144, 1904) then records "a cocoon sent from S. Carolina securely fastened to a twig after the manner of *cynthia* or *promethea*." For further references to this subject see 'Entom. News,' vol. xvi (1905), p. 275 and p. 333 (Soule), p. 310 (Dyar); (1906), p. 32-33 (Skinner), pp. 33 (Soule), p. 112 (Kuschel), p. 177 (Kunzé), p. 225 (Forbes).

It would appear that Webster was about right in his conclusions ('Can. Entom.,' vol. xxxvi, p. 336) "that these insects do the best they can under existing circumstances."—INA B. MUIR; 55, Aberdeen Ave., Westmount, Quebec, Canada.

CHRYSOPA DORSALIS, BURM., AT OXSHOTT, SURREY.—On July 8th, 1921, I took from a Scots fir at Oxshott a second instar *Chrysopa* larva which was new to me, and, having seen the majority of our British species, I suspected that this might prove to be *C. dorsalis*, although the example in question did not entirely answer Miss E. M. Alderson's description of that species (v. 'E. M. M.,' March, 1911). On June 1st of this year I was so fortunate as to observe the emergence of this insect, and was pleased to find that my expectations proved correct. *C. dorsalis* was first recorded as British in 1900, when it was discovered by the late Mr. Alfred Beaumont at Oxshott. Since then, I believe I am right in saying, it has not been captured in that locality. Near King's Lynn in Norfolk, however, Mr. E. A. Atmore has for some years taken it fairly regularly, and in 1917 Mr. B. S. Harwood recorded several specimens which he took near Colchester, Essex. The species is therefore decidedly uncommon in this country, and this record of its reappearance in its old haunts may be of interest.—C. L. WITHYCOMBE; Walthamstow, June 6th, 1922.

THE RELATIVE ATTRACTIVENESS OF VARIOUS TYPES OF ELECTRIC LIGHT FOR MOTHS.—Some interesting letters have recently appeared in this Journal anent the attraction and non-attraction of present-day electric street-lamps for moths, and there is a suggestion that the attraction is some kind of electric emanation rather than the actual light vibrations themselves. The writers, however, appear to have left out of consideration that other sources of light are equally attractive to moths and certain other insects as is the electric one. Both oil and gas lamps are powerful attractions, as also is the acetylene light; and even a candle will serve to trap many insects; it therefore seems superfluous to invoke any other kind of ray than the light-ray itself, notwithstanding that the present type of electric light (the gas-filled incandescent filament) seems to attract much fewer moths. I particularise this type of light, as the complaint seems to be against this form, and the Borough Electrical Engineer of Lowestoft informs me that he sees no difference in the attractive power of the old type of arc (the Crompton enclosed arc) and the modern "flame arc." But the filament lamps are certainly less attractive, and this was the case with the old "carbon filament" equally with the present "metallic filament" which has superseded it, and may more than likely be due to the greater intrinsic brilliancy of the "arc" lights. I have collected for twenty-five years at gas and electric lamps and have had some remarkable nights at both. In the year 1904 at Lowestoft I took in one night sixty-four different *species* of moths at the electric lamps, which were of the "Crompton enclosed arc" type on the top of the standards, with "carbon filaments" on the lower arms, which were lit on the extinction of the upper arms. There was a falling off at once in the "visitors" on this taking place, but as it was about 1 a.m. the lateness of the hour (or perhaps I should say the earliness) may account in some measure for this, though I should also be inclined to say the diminution in brilliancy was certainly a factor. I consider the fact that gas and other forms of illumination being equally attractive as electric, does

away with the suggestion that the attraction is due to electric waves. The suggestion of Mr. Stringer that the antennæ of the females might be "transmitters" and those of the males "receivers" is ingenious and imaginative, but it presupposes the power of setting up an electric current in the body of the female, of which there is not the slightest evidence. I have failed with a delicate electro-scope to detect any current emanating from a "calling" female, and with regard to his suggestion of putting the female in a metal box, I have done this with the female of *M. rubi* and males have come to it. The vibration of the wings appears to cause merely an air current, and most likely is simply the result of sexual excitement and has no direct connection with the attraction of the male. One should not lose sight of the fact that this peculiar sense of sexual attraction at a distance is not confined to insects, but exists, as is well known, in other animals. It would, as suggested by Mr. Nicholson, be very instructive and perhaps enlightening to have an analysis of various lights and some direct experiments with them on their relative attractiveness.—J. E. CAMPBELL-TAYLOR; Lewes, Sussex.

THE SALE OF DR. CHAPMAN'S BOOKS: A SEQUEL.—In my review of the sale of this library in the April number of the 'Entomologist,' I mentioned that sets of the 'Stett. Ent. Zeit.' and of the 'Annales of the Société Entomologique de France' were sold for £3 each set. I now learn, from a friend, that the identical set of the former has been recently offered to him for £30! and a set of the latter for £150!! Comment is unnecessary! I hope to return to the subject of the present value of old entomological books in this magazine at an early date.—W. G. SHELDON; May 9th, 1922.

PSITHYRUS DISTINCTUS IN KENT.—On June 7th, at Birchwood, I took a ♀ specimen of *Psithyrus distinctus*, this being the first of the species that I have encountered in this locality.—F. HOWARD L. JUM, F.L.S., F.Z.S., F.E.S.; Fernside, Shepherds Lane, Dartford.

COLIAS CROCEUS AT DELAMERE.—A *Colias croceus*, which I think was a female, was seen flying at Delamere on May 28th. On June 4th, also at Delamere, Mr. W. Rutter and myself saw three more, two males and a female var. *helice*, the latter *in cop.* with one of the former.—A. H. THOMPSON; 54, Church Road, Northwich.

RECENT LITERATURE.

The Bulletin of the Hill Museum: A Magazine of Lepidopterology.
 Edited by J. J. JOICEY and G. TALBOT. Vol. i, No. 1.
 Pp. 200 + 32 plates. London: John Bale, Sons & Danielsson,
 Ltd. October, 1921.

Though somewhat belated, it is hoped this notice is not too late to convey to Mr. Joicey and his assistants our congratulations on the appearance, and on the contents, of this new publication. As the title explains, the magazine is devoted entirely to Lepidoptera, and commences with a brief notice of the aims, methods, and previously published results of work undertaken at the Hill Museum. The bulk of the text is occupied by papers contributed by Messrs. Joicey,

Talbot and Prout and Miss Prout, representing the valuable results of Mr. T. A. Barns' expedition through East Central Africa on behalf of the Museum, which adds to science a large number of new and interesting species. The new material obtained from the little-known island of Hainan by Mr. C. T. Bowring is also worked out by Messrs. Joicey and Talbot. Of biological interest is the first article, admirably illustrated, by Mr. Talbot, on "*Euploeinae* forming Mimetic Groups in the Islands of Key, Aru, Tenimber, etc." The information in this paper is the more valuable because the method of collecting was known and the *whole* of the material passed through the writer's hands. The volume is fortunately not spoilt by the lack of an index: a very comprehensive one is included.

We are glad to know that Part 2 of this magazine is already on the way. N. D. R.

Der Insektenkörper und seine Terminologie. By Dr. H. KARNY. Pp. 93. Vienna: A. Pichlers Witwe & Sohn. Price 7 marks.

Dr. H. Karny, Lecturer in Vienna University, but at present engaged in the Zoological Museum, Buitenzorg, Java, has written the above most useful little book on the insect body and its terminology. The book is meant for a help in the identification of insects, and especially for a supplement to the author's 'Tabellen zur Bestimmung einheimischer Insekten.' It consists of the following parts: (1) The insect body in general; (2) the metamorphosis of insects; (3) a discussion of the several orders; (4) the phylogeny of insects; (5) an explanation of the principal technical terms in alphabetical order—this last part embracing 32 pages.

The book's value is much increased by 45 excellent woodcuts, illustrating mouth-parts, antennæ and venation. It should prove of great use both to beginners and to advanced students, especially to those who wish to make themselves familiar with the terminology employed in German entomological literature. R. L.

Empire Forestry; Journal of the Empire Forestry Association. Vol. i. Pp. 125. London: Macmillan & Co. March, 1922.

This new periodical is intended to be published quarterly with the avowed object of fostering an interest in forestry at home and overseas. We are glad to note this further evidence of the awakening of a conscience in the matter of the preservation and maintenance of our vast forest resources, so wantonly destroyed in the past. It is a question to which entomologists have always been fully alive, and the article by Mr. R. L. Robinson in the present volume ("Forestry in the Empire") does little to dispel the gloominess of the outlook. At the end is a useful short bibliography of recent works connected with forestry. Many of our readers should find matter of interest in this publication. N. D. R.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, Apr 5th, 1922.—The Rt. Hon. Lord Rothschild, F.R.S., etc., President,

in the Chair.—The following were elected Fellows of the Society: Messrs. William George Clutten, 136, Coal Clough Lane, Burnley; Edmund James Pearce, The Lodge, Corpus Christi College, Cambridge; George Evelyn Hutchinson, Aysthorpe, Newton Road, Cambridge; Charles Herbert Lankester, Cartago, Costa Rica; Arthur D. R. Bacchus, 29, Abbotsford Road, Redland, Bristol; and Captain Douglas S. Wilkinson, Kennington Vicarage, Ashford, Kent.—*Exhibits*: Lord Rothschild exhibited a group of mimetic Lepidoptera and Hymenoptera from South America.—Mr. W. G. Sheldon exhibited, on behalf of Mr. T. Greer, a series of *Epinephile jurtina* and of *Pieris napi* from Co. Tyrone. Mr. A. W. Pickard-Cambridge exhibited Zeller's types of a number of moths, mainly Crambids, from Egypt and Palestine.—Mr. W. F. H. Rosenberg exhibited an example of *Colaenis telesiphe tithraustes* from Ecuador, in which the band of the hind wing is white as in the typical form.—Mr. G. T. Bethune-Baker exhibited a series of *Heodes phloeas*, and a specimen of *Zygaena transalpina* ab. *elongata* from Florence.—Dr. G. A. K. Marshall, on behalf of Mr. B. P. Uvarov, exhibited some remarkable mimetic long-horned grasshoppers with their Cicindelid models.—Dr. J. Jordan, F.R.S., exhibited a pair of the Agaristid moths, *Aegocera mahdi*, the male of which has a stridulatory organ; also a series of *Liphyra brassolis*.—Dr. S. A. Neave gave an account of the fauna of Mt. Mlanje, Nyasaland, and illustrated his remarks with lantern-slides and with an exhibition of some typical insects from that locality.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*March 23rd*, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—The death of Mr. Lachlan Gibb, F.E.S., a life member, was announced.—Mr. Goodman exhibited an aberration of *Argynnis aglaia* with the discal blotches much increased in area and united to form an irregular band.—Mr. Grosvenor, Dr. Chapman's bred series of *Callophrys avis*.—Mr. Turner, the remarkable silver Satyrid *Argyrophorus argenteus* from Chili.

April 13th.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. A. A. W. Buckstone, series of *Brenthis euphrosyne* all strongly marked, taken on high ground at Horsley compared with others taken at a much lower elevation in the valley. Also one from Oxshott with xanthic markings, and ab. *obscura* of *Cleoceris viminalis* from Yorks.—Mr. Enefer, beetles attacking lentils from Egypt.—Mr. Withycombe, the results of pine-beating at Bagshot, including *Panolis piniperda*, larvæ of *Ellopiopsis prosapiaria*, *Chrysopa vulgaris* and *C. prasina* with its prey *Chermes laricis*.

April 27th.—Mr. K. G. Blair, B.Sc., F.E.S., Vice-President, in the Chair.—Messrs. A. D. Hobson, of Highgate, W. Rait Smith, F.R.S., of Bickley, and A. G. West, of W. Dulwich, were elected members.—Mr. S. S. Green, F.E.S., gave a lecture on "British *Coccidæ*," with blackboard sketches and numerous coloured figures of species and their depredations.—Mr. Grosvenor, a collection of the species and forms of the genus *Endrosa* (*Setina*).—Mr. Step, a living salamander (*Salamandra maculosa*), which he and his son had found under a heap of stones by the roadside near Boulogne.—HY. J. TURNER, *Hon. Editor of Proceedings*.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—Larvæ: Vinula, Furcula, Reclusa, Versicolor, Flavicornis, Spinula, P. populi, Badiata, Lubricipeda, Mendiastri, Prodrumaria, Illumaria, Melanic Betularia, etc. *Desiderata.*—Sphingidæ, Bombyces, and Pseudo-Bombyces, Ligniperda, Hyale, Athalia, etc.—*Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.*

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, October 4th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Ordinary Meetings, Thursdays, July 13th and 27th, at 7 p.m. Field Meetings, Saturdays, July 15th, at Horsley, 29th at Eastbourne.*—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

CONTENTS.

Blastobasis lignea, Wlsm. (Lep.): A Species New to Britain, *Wm. Mansbridge, F.E.S.*, 145. An Entomological Holiday in S. France, *K. G. Blair, B.Sc., F.E.S.*, 147. A New Species of *Ecillia*, A Genus of Anthribidae (Col.), *Dr. K. Jordan*, 152. Notes on British Odonata in 1921, *W. J. Lucas, B.A., F.E.S.* (continued from p. 127), 152. Collecting in 1920 in Gloucestershire, North Wales, etc., *C. Granville Clutterbuck, F.E.S.*, 155. A Synopsis of British Proctotrypidae (Oxyura) *Claude Morley, F.E.S., F.Z.S.* (continued from 135), 157.

NOTES AND OBSERVATIONS.—*H. Rowland-Brown*: A Correction, *W. G. Sheldon*, 161. *Colias croceus* (edusa) in Surrey, *Baron Bonck, F.E.S.*, 162. *Colias croceus* in Surrey, *T. H. L. Grosvenor*, 162. *Pyrameis cardui* and *Colias croceus* (edusa) on the Sussex Coast, *Robert Adkin*, 162. *Colias croceus*, etc., in Sussex, *J. E. Campbell-Taylor*, 162. *Colias croceus* and *Vanessa atalanta* in the Isle of Wight, *A. L. Rayward*, 162. *Colias croceus* in Wiltshire, *A. P. G. Michelmores*, 162. *Colias croceus* in Devonshire, *Miss Hinchliff*, 162. *Colias croceus* (edusa) in S. Devon, *S. T. Stidston, R.N.*, 162. *Colias croceus* in Cheshire, *Alfred Newstead*, 163. *Manduca atropos* in S. Devon, *S. T. Stidston, R.N.*, 163. *Phryxus livornica* at Merton, Surrey, *F. J. Coulson*, 163. *Phryxus livornica* in Warwick, *J. R. Sleath*, 163. *Phryxus livornica* (?) at Cardiff, *W. E. R. Allen*, 163. Sugaring Results in 1921 and 1922, *H. C. Jeddere-Fisher*, 163. The Cocoons of *Telea polyphemus*, *Ina B. Muir*, 163. *Chrysopa dorsalis*, Burm., at Oxshott, Surrey, *C. L. Withycombe*, 165. The Relative Attractiveness of Various Types of Electric Light for Moths, *J. E. Campbell-Taylor*, 165. The Sale of Dr. Chapman's Books: A Sequel, *W. G. Sheldon*, 166. *Psithyrus distinctus* in Kent, *F. Howard Lancum, F.L.S., F.Z.S., F.E.S.*, 166. *Colias croceus* at Delamere, *A. H. Thompson*, 166.

RECENT LITERATURE.—The Bulletin of the Hill Museum: A Magazine of Lepidopterology, 166. Der Insektenkörper und seine Terminologie, 167. Empire Forestry; Journal of the Empire Forestry Association, 167.

SOCIETIES.—The Entomological Society of London, 167. The South London Entomological Society, 168.

“ENTOMOLOGIST”

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1912, Vol. 45) at 15s. each; 1915 and 1916 at 10s. 6d.; 1917, 15s.; 1919, 19s. 6d.; 1920, 25s.; 1921, 25s. Carriage extra.

THE ‘ENTOMOLOGIST’ SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By *RICHARD SOUTH, F.E.S.* Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

Subscriptions for 1922 (12s.) are now due and should be sent to R. South,
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.

Vol. LV.]

AUGUST, 1922.

[No. 711.

THE

ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

NATURAL HISTORY BOOKS AND SERIALS.

WHELDON & WESLEY, LTD.

have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers.

Large Collection of Entomological Books always in Stock.

Separate Catalogues on all subjects twopence each, post free.

Libraries or small parcels purchased.

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

CABINETS.

Finest Materials. Best Workmanship.

Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

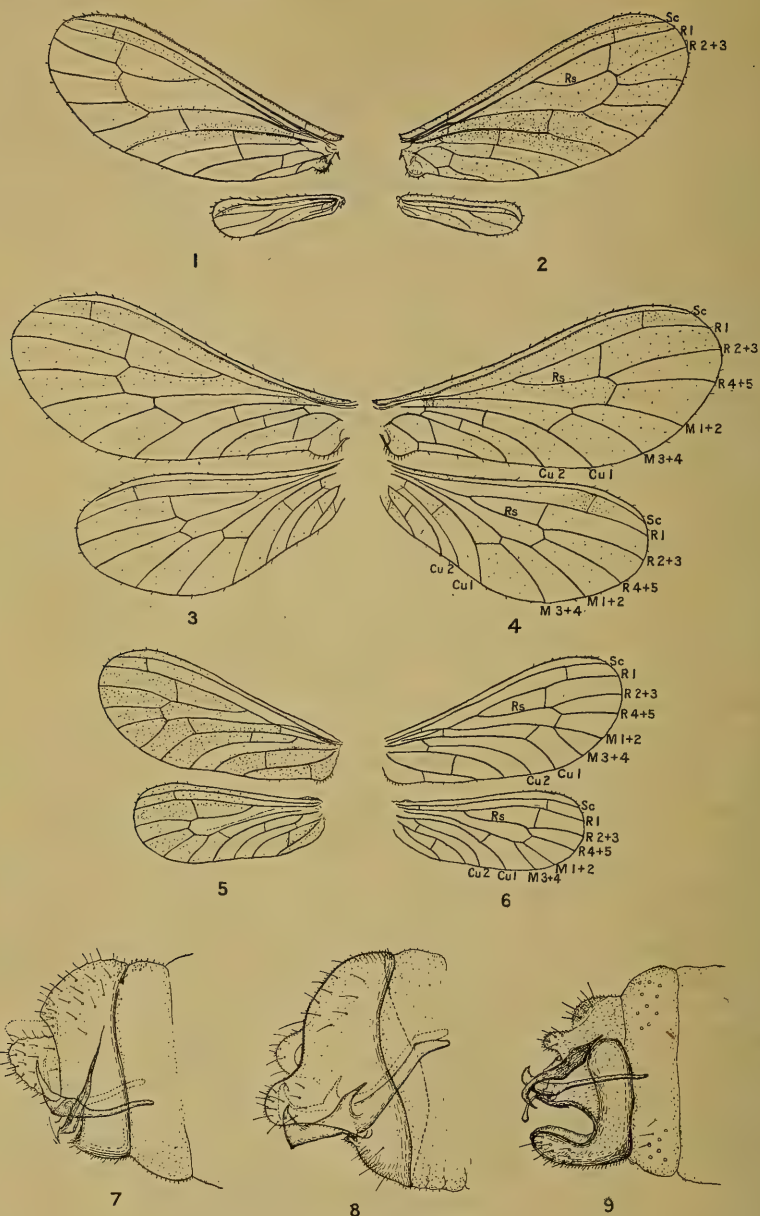
Write for Lists to

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11

227100 100000





CONIOPTERYGIDÆ.

WINGS.

MALE GENITALIA.

- | | |
|-------------------------------|------------------------------------|
| 1. <i>C. psociformis</i> . | 4. <i>S. aleurodiformis</i> , var. |
| 2. <i>C. pineticola</i> . | <i>curtisiana</i> . |
| 3. <i>S. aleurodiformis</i> . | 5. <i>P. annae</i> . |
| | 6. <i>P. fuscipennis</i> . |

- | |
|-------------------------------|
| 7. <i>C. psociformis</i> . |
| 8. <i>S. aleurodiformis</i> . |
| 9. <i>P. annae</i> . |

THE ENTOMOLOGIST.

VOL. LV.]

AUGUST, 1922.

[No. 711

PARASEMIDALIS ANNÆ, ENDERLEIN, A CONIOPTERYGID NEW TO BRITAIN, WITH NOTES ON SOME OTHER BRITISH CONIOPTERYGIDÆ.

By C. L. WITHERCOMBE, B.Sc., F.E.S.

(Plate II.)

ON June 17th, 1922, when beating Scots fir at Oxshott, I noticed among the numerous *Coniopteryx pygmaea* present, a darker specimen which appeared to me distinct. Closer examination showed this to be a female of *Parasemidalis annae*, Enderlein, a species not hitherto recorded as British. This species was described by Enderlein in 1905 from a single female taken at Berlin, which he distinguished from *P. fuscipennis*, Reuter, mainly on the position of a cross-veinlet in the hind wing. In my specimen this cross-veinlet was correctly placed in the right hind wing for *P. annae*, but in the left hind wing the venation was intermediate between *P. annae* and *P. fuscipennis*. As this kind of variation is very common in the Coniopterygidae, I was anxious to settle the identity of my species. Therefore on June 24th I went again to Oxshott, and secured eight more specimens—two males and six females—by beating the pines.* These were typical *P. annae* or intermediate, but one female had the right hind wing as in *annae*, the left hind wing being as in *fuscipennis*.

Parasemidalis belongs to that tribe of the Coniopteryginae with subequal wings (Coniopterygini of Enderlein), and can be separated from *Coniopteryx* by the forking of the media in the hind wings. Two genera possess a biramous media in the hind wings, *Semidalis* and *Parasemidalis*. In *Semidalis* the cross-vein between fore cubitus Cu_1 and media strikes the latter on the lower arm of fork M_{3+4} in both wings (Fig. 4), while in *Parasemidalis* this cross-vein strikes M on the stem of fork and below fork point (Fig. 6). In the field *Parasemidalis* can at once be recognised by its dark grey colour.

Enderlein, in his "Monograph of the Coniopterygidae," 'Zool. Jahrb.' 1906, records two European species of *Parasemidalis*—*P. annae*, Enderlein, 1905, and *P. fuscipennis*, Reuter, 1894. The latter may, he says, be distinguished from *P. annae*, End.,

* Since writing, two more specimens have been taken at Oxshott by Mr. W. E. China and four more by myself.

by the termination of the cross-vein between R_1 and R_s , in the hind wing, on R_{2+3} instead of on the stem R_s (Figs. 5 and 6), by the pubescence of the wing, by the red-brown colour of the wing membrane, and by the blacker hind wing.

The position of cross-veins I regard, from my study of this family, as being very liable to variation, and I have already mentioned that one specimen of mine (♀) has one hind wing as in *annae* and the other as in *fuscipennis*. Thus the venational character, on which most stress is laid, is a poor one. As regards the pubescence of the wing I should not like to make a definite statement, but of the two species under consideration I should be inclined to place mine as *fuscipennis* on this character. The pigmentation of the wing membrane is, as a rule, very variable. In *Coniopteryx pygmaea*, End., for instance, some specimens have dark brown or blackish wings, while in others the membrane is almost colourless. This is not due to the age of the specimen. Therefore, although my specimens of *Parasemidalis* have blackish wings and not brown, I do not think much importance can be attached to this distinction. However, since they have in great majority the venation of *P. annae*, I shall provisionally consider them as such until further work shall confirm or disprove.

In all the insects examined, the more strongly chitinised parts of the body, *i. e.* head and appendages, thoracic sclerites, legs and tip of abdomen are blackish brown; the rest of the body, including wings, dark grey. Antennæ are longer, and somewhat thicker basally, in males than in females. Number of antennal joints in two ♂♂, 31 and 32 respectively. In females the antennæ are 27- to 29-jointed, but one example has the exceptional number of 32 joints. I find no records of a male of either of the two European species of *Parasemidalis* having been taken, and therefore avail myself of this opportunity of figuring the male genitalia (Fig. 9).

The whole body of the insect is covered very sparsely with the waxy powder common to the Coniopterygidæ. This powder, it should be stated, is secreted by glands in definitely arranged areas on the body of all Coniopterygidæ, and is rubbed over the wings by the insect shortly after emergence. This it does by scraping the abdomen with its hind femora, then rubbing these over and between the two pairs of wings. It is strange that this habit has apparently not been noticed previously, since a very similar proceeding obtains in the Aleurodidæ.

The method of pairing is somewhat unusual, and for *Parasemidalis* is as follows: The male approaches the female from behind, and, pushing his head under the wings of the female, seizes her hind coxæ with his jaws. Now he grasps her hind legs with his fore legs, and bending up the tip of his abdomen, pairing is effected. In this way the male is carried about, the female being able to use only her first two pairs of legs for walking.

The pair separated, in each case observed, after about five or ten minutes.

Eggs are laid on pine needles, lying attached by their flat sides. They are .4 mm. long, white in colour, oval, but rather short as compared with the eggs of other Coniopterygids. The micropylar end is drawn upwards and pointed. I shall hope shortly to be able to give further details of the life-history of this species, together with a full account of our other British species.

The Coniopterygidæ are well worthy of more attention from entomologists, and present many interesting biological problems. They are semi-gregarious in habits, and where found are usually to be taken in numbers. They fly very little. Variation, especially in wing venation, is common, and as species have been largely named on such characters, the family requires much reinvestigation. Being semi-gregarious in habits, with poor locomotive powers, colonies of a form may be found on one tree differing considerably from another form of the same species found elsewhere. With a view to clearing up some of these points I have been breeding these insects in captivity and studying the forms obtained. *Semidalis* is thought to possess two British species—*S. aleurodiformis*, Steph., and *S. curtisiana*, End. These I find are one and the same, having bred both forms from the eggs of one female. *S. curtisiana* was separated from *S. aleurodiformis* by Enderlein on the position of the cross-vein between R_1 and R_s in both pairs of wings. In *S. aleurodiformis* this cross-vein strikes the radial sector on the upper arm of fork R_{2+3} , whereas in *S. curtisiana* it strikes the stem R_s . In a series of this species—I have examined more than fifty examples—one can observe all stages between the forms *curtisiana* and *aleurodiformis*. The only other character noted by Enderlein is the tarsal ratio, and this I also find variable. The species *curtisiana* was described from females only. I therefore now figure the male genitalia (Fig. 8), which, of course, are identical for both *aleurodiformis* and *curtisiana*. It is highly probable that *Parasemidalis fuscipennis* and *P. annæ* are also one and the same.

Coniopteryx pygmaea, End., and *C. tineiformis*, Curt., are good species, having distinct larvæ. They are, however, liable to variation, and intermediate forms occur which often render determination difficult.

With the genus *Conwentzia* I am still somewhat puzzled. We have two species, *C. psociformis*, Curt., and *C. pineticola*, End. Bagnall brought forward *C. cryptoneuris*, Bagn., as a new species in 1915. This is identical with Enderlein's *C. pineticola*, var. *tetensi*. Bagnall mentions also the lack of pigmentation of the membrane in the outer cells of the wing, but this is quite unreliable as a character and very variable. The remaining species, *C. psociformis* and *C. pineticola*, present many difficulties. They are separated as follows by Enderlein:

Hind wings considerably reduced.

Cross-vein between R_1 and R_s in fore wing striking the upper arm R_{2+3} of fork. Antennæ 38- to 43-jointed *psociformis*, Curt.

Cross-vein between R_1 and R_s in fore wing striking the stem R_s of fork. Antennæ 28- to 34-jointed *pineticola*, End.

Both species are of similar habits. I am at present only able to distinguish between the larvæ by the fact that in *C. psociformis* the antennæ are longer, as indeed might have been expected. The male genitalia appear to be the same in both species (Fig. 7). Intermediate forms occur. I have two ♀♀ and one ♂ from Heston, 1921, which have 37-jointed antennæ, and the cross-vein between R_1 and R_s striking the latter at the fork point. These were the only examples of *Conwentzia* taken in this locality, and evidently represent a distinct race. I have a similar but very large and well-marked example from Epping Forest. In breeding experiments I have not yet found a sufficient variation to indicate that the two species *psociformis* and *pineticola* are not distinct. It has been already mentioned that the Coniopterygidæ are of semi-colonial habits, and this remark applies especially to *Conwentzia*, in which colonies occur completely isolated from one another when only a short distance actually separates them. Possibly the two species under consideration may have been isolated in this way. Under these circumstances we must for the present leave *Conwentzia* as comprising two forms which, within limits, breed true.

Our British list therefore now comprises seven species :

Conwentzia psociformis, Curtis.

„ *pineticola*, Enderlein.

Coniopteryx tineiformis, Curtis.

„ *pygmaea*, Enderlein.

Semidalis aleurodiformis, Stephens, and its var. *curtisiana*, End.

Parasemidalis ? *fuscipennis*, Reuter, and *annae*, Enderlein.

Helicoconis lutea, Wallengren.

The last species was discovered by J. W. H. Harrison in 1915, and recorded in the 'Naturalist,' 1916. He rejected Enderlein's generic name in favour of *Aleuropteryx*, Low. As I have very little experience of this form, I have provisionally retained Enderlein's genus, though it is very possibly, as Harrison says, a poor one.

Walthamstow ;

July 1st, 1922.

CO-ORDINATED RHYTHM IN INSECTS; WITH A
RECORD OF SOUND PRODUCTION IN
AN APHID.

BY C. B. WILLIAMS, M.A., F.E.S.

THERE are many scattered records of co-ordinated or collective action in insects scattered through entomological literature, which, however, do not seem to have attracted the attention they deserve.

Mass migrations of locusts, butterflies and dragonflies are a form of co-ordinated movement; termites and processionary caterpillars have a "follow-my-leader" habit which is somewhat related, and the up-and-down movement of clouds of midges, other diptera and some may-flies also shows a collective spirit.

Of greater interest are rhythmic actions which are carried out by a number of insects simultaneously and synchronously. Those so far recorded refer to the rhythmic production of light and sound, and it is the purpose of the present note to draw attention to the more interesting of these and to record a new case of rhythmic sound production, which is of particular interest in that it was found in an Aphid, in which family, so far as I am aware, sound production has not yet been recorded.

The existence of synchronised flashing of fire-flies has been the subject of much dispute. My own observations during five years' residence in the West Indies and Tropical America, where both Lampyridæ and Elateridæ are abundant, have so far produced no evidence for it, but in view of the circumstantial accounts from other parts of the world its existence must undoubtedly be admitted.

Severin, as early as 1881 ('Nature,' vol. xxiv, p. 165) writing of an unidentified Indian Lampyrid says: "The curious pulsation or flashing of their light is remarkable, the insects on the tree all act in perfect concert, i.e., five seconds of no light, then seven rapid flashes; five seconds no light, seven flashes; and so the game continues throughout the dark hours." He states also that insects on trees close together keep the same time, but "groups of trees separated by one or two hundred yards may not agree, and do not do so as a rule."

Muir, speaking of fire-flies in Borneo ('Hawaiian Ent. Bull.,' vol. xiii, p. 67) says: "In some places thousands had congregated together and all kept time with the pulsations of their light."

A still more definite account is that given by Hess ('Biol. Bull.,' vol. xxxviii, 1920, p. 39), when he describes *Photinus consanguineus* flashing in concert in a small valley near Ithaca, N.Y. He writes: "For a moment there was a blaze of flashing lights, and then for a moment it was darkness, except for an occasional flash which seemed to come from a different species." This was noticed on two nights, on the second of which Hess found that

they would respond to an electric light if flashed just previous to the time of their normal light. He notes, however, that during five years he had never at any other time seen this co-ordination in *P. consanguineus* or any other species.

Still more recently, O. A. Rheinking ('Science,' May 20th, 1921), describes the synchronised flashing of fire-flies of the genus *Caliphotes* in Siam, where all the insects on one tree flashed together perfectly at regular intervals at a rate of between 105 and 109 flashes per minute.

Other records are quoted in the above and Blair ('Nature,' vol. xevi, 1915, p. 411) says that the phenomenon has been noticed in the European species of *Luciola* and in the genus *Aspidiosoma* in South America.

Turning to the co-ordination of sound production I have only been able to find a very few records. Sharp ('Camb. Nat. Hist. Ins.,' vol. ii, p. 156) gives two of these without references. The first, credited to Forbes, refers to a large brown ant found in Sumatra which produces a tapping noise by striking the leaf with its head. It is a species of the genus *Polyrachis*. The individuals were "spread over a space of perhaps two yards in diameter on the stem, leaves and branches of a great tree which had fallen, and not within sight of each other; yet the tapping was set up at the same moment and stopped at the same instant. After the lapse of a few seconds all recommenced at the same instant. The interval was always of about the same duration, though I did not time it; each ant did not, however, beat synchronously with every other in the congeries nearest to me; there were independent tappings so that a sort of tune was played, each congeries dotting out its own music, yet the beginnings and endings of the musical parties were strictly synchronous."

The second record given by Sharp is that according to a Mr. Peal, an ant, presumably an Assamese species, "makes a concerted noise loud enough to be heard by a human being at twenty to thirty feet distant, the sound being produced by each ant scraping the horny apex of the abdomen three times in succession on the dry crisp leaves of which the nest is usually composed.

In 1900 Gounelle ('Bull. Ent. Soc. France,' 1900, p. 168), describes the sounds produced by a large number of termites tapping with their heads on dried leaves of Bromeliads in Brazil, but the movement is apparently not rhythmic and he describes it as "like a pinch of sand hitting paper." In the same paper he also describes a concerted noise produced by ants of the genus *Camponotus* in rolled-up leaves of bamboo, again by tapping with their heads.

The last record is of the "Snowy Tree Cricket" (*Oecanthus niveus*) of which Comstock says ('Introduction to Entomology,'

2nd Ed., 1920, p. 93), "All in any locality chirp in unison. Early in the evening, when the chirping first begins, there may be lack of unanimity in keeping time, but this only lasts for a short time—soon all chirp in unison and the monotonous beat of their call is kept on uninterrupted throughout the night. Individual singers will stop to rest, but when they start again they keep time with those that have continued the chorus."

To the accounts above I can now add the following from my own experience. On several occasions during the past few years I have observed a co-ordinated action in a dark-coloured aphid which is common at certain times of the year on the young leaves of cocoa in Trinidad and other parts of Tropical America. The aphid was identified for me by Mr. Theobald as *Toxoptera coffeae*, Nietner, and is apparently distributed throughout the world wherever coffee or cocoa is found.

The aphid sits on the undersides of the leaves of cocoa, almost anywhere on the surface but is usually particularly common along the main veins, and when abundant there may be a hundred or more winged and wingless insects in various stages of growth side by side on the leaf.

When such a colony is disturbed by turning over the leaf to the light or by scraping slightly with the finger nail, a greater or smaller number of the aphids on the leaf set up a regular and rhythmic movement which consists essentially of raising the hind part of the body into the air, keeping the head fixed and the beak still in the leaf tissue.

The raising and lowering movement occupies about one second and it is repeated at intervals of three or four seconds with great regularity, sometimes for twenty or thirty times. If the colony is responsive every aphid on the leaf will be moving in absolute co-ordination and with absolute regularity.

Sometimes two or three separate movements will be set up on one leaf so that all in one section are keeping time with each other, but not with another section, but more usually all on one leaf move together. Individuals quite isolated would keep regular time with the rest.

While observing this closely I found that each movement was accompanied by a distinct scraping sound, audible, with a big colony, as much as eighteen inches away from the leaf and clear enough for me to be able to tell when the aphids were moving without seeing them.

I do not know whether the sound is a deliberate production on the part of the aphid, or whether it is an accidental result of the movement magnified by the leaf surface. I have carefully examined mounted specimens of the aphid with a microscope, but have been unable to find any trace of a stridulating organ.

That the movement is significant and not accidental is shown by the fact that I have observed it on at least a dozen occasions

in localities as widely separated as Panama and Costa Rica in Central America, and in the islands of Grenada and Trinidad in the West Indies, but always, and only, on this one species of aphid.

It has been suggested to me that the movements are protective and designed to ward off parasites, and in this connection it should be noted that on one occasion I observed that the aphids on a leaf that I had not touched were moving rhythmically, and further search disclosed the presence of two syrphid fly grubs moving among them and feeding on the colony. It must also be recollected that the sound, if deliberate, may be awe-inspiring to some small enemy although almost inaudible to our ears.

This whole question of synchronised actions needs much more investigation before a complete understanding is likely to be found. At the same time, it seems likely from the above that we are dealing with extremely rapid responses of a large number of individuals to a single impulse or stimulus. In the case of the fire-flies recorded by Hess this seems the obvious explanation, and in most of the other cases it could also be applied. All the above insects, and many others, normally produce rhythmic actions as individuals, and when large numbers are within range of an original stimulus, the synchronising of the rhythm is natural. In the case where each individual gets its stimulus from the one next to it we would expect a more or less rapid wave from one end of the association to the other. Something of this nature was seen by Hess.

The case of the aphids shows that if two sets of rhythm are in progress at the same time, some individuals will respond to one and some to the other, but none are able to respond to the stimulus from the other section which takes place between their own pulsations and outside their rhythm.

Cairo;

June 9th, 1922.

A NEW FOSSIL LONGICORN BEETLE.

By T. D. A. COCKERELL.

LAST year, when at Cambridge University, I was kindly permitted by Prof. Marr to study a collection of Miocene fossils from the famous locality at Æningen in Baden. I wrote a paper on certain fossil beetles in the collection, and sent it to the 'Canadian Entomologist.' Through some mischance it never reached the Editor's hands, and unfortunately the figures are lost and cannot be replaced. There was, however, one very fine new longicorn (Prioninæ), which should be made known.

Ergates atavellus, n. sp.

Length about 25 mm.; entirely piceous; width of head 6 mm., of prothorax 8 mm., length of prothorax nearly 4 mm., its sides hardly convex in profile, exceedingly minutely and briefly denticulate, the only clearly visible denticles being a couple above the anterior femora, not far apart, but there are faint indications of others; antenniferous tubercles large and prominent; antennal joints measuring in mm. (1) 3·7, (2) ·5, (3) 4·9, (4) 4·5, (5) 4, (6) 4, (7) 3·5, (8) 3·5, (9) 3·5; anterior tibiæ 5 mm. long; elytra 16·5 mm. long and 5 wide.

Labelled "*Prionus*, Upper Molasse, Eningen (Whidborne Collection)." It is on a slab with about nine *Planorbis declivis*, A. Br.

It agrees with *Ergates* in form, in antennæ, etc., but differs by the almost obsolete denticulation of sides of prothorax, and smaller sizes.

From the American *E. (Trichocnemis) spiculatus*, Lec., it differs by the much shorter third antennal joint, which is about equal to the fourth; in *spiculatus* the third is about 10 mm. and the fourth 3·5 mm. It also seems to lack the distinct ridges on the elytra, or they are very obscure. The elytra also are broadly rounded at the end, without a denticle at the inner corner, so far as can be seen.

In the European *E. faber* (L.), the characters are much more like those of the fossil, both as to elytra and thorax, but in that also the third antennal joint is much longer than the fourth.

Heer figured from Eningen two species of *Ergates*, under the generic name *Prionus*. They are said to have no teeth or serrations at the sides of the thorax.

E. polyphemus (Heer) is said to be very like *E. faber*, and is of the same size. The elytra are 33·5 mm. long, and the third antennal joint is about twice as long as the fourth.

E. spectabilis (Heer) has the elytra 22 mm. long and 5·3 wide, with very distinct longitudinal ridges as in *E. spiculatus*. The thorax is considerably narrower than in our fossil. The antennæ are poorly drawn, but the third joint is considerably longer than fourth, and the antennæ are less attenuate than in ours.

Scudder in 1895 reported a *Prionus*, n. sp., from Eningen, but gave neither description nor name.

The genus *Ergates* is to-day represented by few species, placed in three different subgenera. It appears to represent the remnants of a formerly more extensive group. The related genus *Callipogon* is neotropical.

I also found in the collection, from Eningen, three specimens of *Anoplitis breinii*, Heer. The genus *Anoplitis* is American, and I think Heer's fossil is not congeneric, but falls better in the

Oriental genus *Gonophora*, from which it differs by the short antennæ (beetle about 5·7 mm. long, antennæ about 1·5 mm.). The sides of the thorax, seen from above, are distinctly concave below the median angle, practically as in *G. chalybeata*, Baly. For the present I think the fossil may stand as *Gonophora breinii*.



Danais chrysippus, ab.

SOME CURIOUS ABERRATIONS OF *DANAIS* *CHRYSIPPUS*, L.

BY CAPT. KENNETH J. HAYWARD, F.E.S.

WHILST collecting at Reservoir (near Aswan, Egypt) on January 15th, I took a very curious aberration of *Danais chrysippus*, L., of which an illustration is given above. As will be seen, the left hind wing is toothed at vein 5 in the form of a tail 5 mm. long, below which it curves sharply inwards, resuming the normal shape again at vein 3. The usual white markings in the black marginal border are entirely absent in the hind wings, and only occur as one or two isolated pin-points on the fore wings. The tailed wing has not the usual slightly scalloped edge.

1. *Danais chrysippus*, L., ab. *axantha*, ab. nov.

♂ ♀. Antennæ black. Head, thorax and abdomen black, marked with white as in *chrysippus*. (In some specimens the abdomen above is dark brown, heavily dusted with black.) Fore wings and

hind wings above a uniform dark brown, marked with black and white as in *chrysippus*. *Underside*: *Fore wing* dark brown, the yellow ground-colour showing only in the apical area and at the inner angle, marked as in *chrysippus*: *hind wing* as in *chrysippus*.

Described from 2 ♂♂ and 3 ♀♀ bred at Aswan and in coll. auct., December, January and February.

The above aberration differs from f. *cratippus*, Fldr., in that the dark brown colouring extends evenly over all the upper-side. Beneath it resembles *cratippus*. I have never taken it wild but have bred it not uncommonly from late December till early February, namely during our cold weather. I have bred over 3000 *chrysippus* during the last two and a half years, and invariably found that the cold-weather broods produced a large percentage of dark specimens, sometimes as many as 35 per cent. being the f. *cratippus*, whilst spring and autumn broods seldom produce more than 5 per cent. dark specimens, and summer broods are always lightly coloured.

2. *Danaïs chrysippus*, L., ab. *candidata*, **ab. nov.**

♂. *Antennae* black. *Head* black marked with white as usual. *Eyes* dull dark red. *Thorax* black with a white central stripe. *Abdomen* above ash-grey; beneath light grey; marked with white as in *chrysippus*. *Wings* both above and below of a pale whitish-buff ground-colour, the costal and basal areas of the fore wings grey, the wings having the apical patches and margins black marked with white as in *chrysippus*, the veins light grey.

Described from a male in coll. auct. bred Aswan, Egypt, January, 1922. Probably occurs rarely everywhere amongst typical specimens.

Aswan, Egypt.

THE LIFE-CYCLE OF *PENTHINA SOROCULANA*, ZETT.

By W. G. SHELDON, F.Z.S., F.E.S.

THE life-cycle of this, in certain districts, common species, is very little known, and, so far as I am aware, a reliable description of the larva even does not exist. Barrett speaks of it—"larva hardly described." Dr. Chapman says, "it is a very active green larva, feeding on birch between leaves flatly united, in August, September, and October." Machin says, "it spins up between two united leaves and lies in pupa during the winter." Kennel, 'Pal. Tort.', gives similar short particulars. These details are correct so far as they go, but they do not go very far, and as in June, 1921, at Lochinver in Sutherlandshire I captured a female, she was put up for eggs, with the result that I made the following observations on the early stages:

The ova were deposited on June 29th, singly, on upper and lower sides of leaves of birch.

The following day the ova were pale green, opalescent, and semitransparent, the veins of the leaf showing through the ovum. The length was .9 mm. by .7 mm. As the larva develops in the ovum it shows conspicuously, especially the dark head. The surface is of the usual tortrix pattern, divided into a number of spaces by ridges, irregularly shaped, but with the sides of the spaces consisting of straight lines; the polar axis of the ovum is, of course, horizontal. The larvæ commenced to emerge on July 13th, and the following observations were made on one that hatched on that date.

The newly-emerged larva is about 1.25 mm. long, head brown, lobes prominent, it has a black dot in front of each lobe, the jaws are honey brown; the prothoracic plate is greenish white, the legs and feet black; the segments behind prothorax and claspers are greenish white; there is no sign of anal plate. This larva was put between two birch leaves and kept in an airtight tin box. On July 15th it was eating the lower cuticle of the upper leaf, making small sinkings in it.

On July 23rd the larva had changed into second instar, and was now 2 mm. long; the head was jet black and glabrous, with the lobes not so prominent as in the last instar; the prothoracic plate was dark greenish grey with a wide division between it and the head, in colour light grey; the remaining segments, prolegs and claspers were light greenish grey; the larva was very transparent, the contents of the alimentary canal showing as a reddish-brown line; the tubercles were rather noticeable, and lighter than the surrounding areas; the larva was spiny, the anal plate was not noticeable.

On July 30th the larva had changed into the third instar; it was then 3.5 mm. long; head dark brown and glabrous, lobes prominent; prothoracic plate lighter brown; division between head and prothorax light grey. The prolegs were tipped with black, otherwise the larva was in all respects as in last instar. In this instar the larva fed on the inner cuticle of both leaves.

On August 3rd the larva was in the fourth instar, and measured 6 mm. in length; the head was intensely black and glabrous, the lobes were prominent; the prothoracic plate was light greyish green clouded with darker markings near the rear margin; included in these was a black blotch on each side in the subdorsal area. The larva tapered very much to anal extremity. It was with the above exceptions similar to the last instar in all respects.

On August 10th the larva had changed into fifth and last instar and was then 10 mm. long.

The changed appearance in this instar was very noticeable; the head was light greyish green without any darker markings,

and the lobes were not as prominent as in previous instars; the antennæ were very prominent, although not noticeable previously. The frontal plate was lighter in colour than the head itself, and had two black dots near the centre; there were two other black dots outside the antennæ. The segments behind the prothorax were pea-green in colour; the prothoracic plate was rather lighter pea-green; the alimentary canal showed as a dark green dorsal stripe, and there were two, in appearance similar, subdorsal stripes above the spiracles. I could not see any signs of an anal plate; the tubercles were prominent and light coloured; the spiracles were very small and inconspicuous; the claspers and prolegs were pea-green without any darker shading; the spines were light coloured and of about the average length and number that obtain in larvæ of the Tortrix group. The larva tapered greatly to anal extremity, and rested with head flattened out.

On August 16th the larva had increased in length to 16 mm., when it was full grown. Three days later it had not increased in size; the pea-green colour was deeper, and the stripes were not so prominent. It was evidently commencing to pupate.

In order to pupate, the larva (in confinement) spins together two birch leaves, and forming a silken lining to the pocket so formed pupates therein.

The pupa is 8 mm. long, and measures across the dorsum 1.75 mm. broad. The colour of the wing-cases and head are dull greenish buff, of the abdominal segments dull brown with a slight green tint, darker on the dorsal area, and with the divisions of segments darker; the covering of the head projects slightly in the shape of a bulb, but there is no trace of anything in the nature of a cocoon opener. The antennæ cases project rather prominently from the surrounding portions of the pupa; each of the abdominal segments has two rows of about a score of spikelets, each pointing rearwards. The wing-cases extend to near the rear of the third abdominal segment; the abdomen tapers regularly and gradually from the fourth abdominal to the anal segment, which is bent over towards the ventral surface and is furnished with several hooks which keep the pupa in position in the cocoon. The surface of the pupa is not in any way glaucous.

The imagines emerged in May last.

Youlgreave,
South Croydon;
July 13th, 1922.

A SYNOPSIS OF BRITISH PROCTOTRYPIDÆ (OXYURA).

BY CLAUDE MORLEY, F.E.S., F.Z.S., ETC.

(Continued from p. 161.)

4. EXALLONYX FUMIPENNIS, Kief.

Exallonyx fumipennis, André, Spp. Hym. Europ., x, p. 339, ♂.

The female of this species differs from the male in nothing but its sexual characters and in having the antennæ stout with the six basal flagellar joints subserrate, and in its greater length of $4\frac{1}{2}$ mm. The typical male form is from Austria and not yet recorded from Britain; the female is here described for the first time.

The British varietal male was taken in England with the ant, *Myrmica scabrinodis*, by Donisthorpe, and subsequently in France by André. But the typical form also occurs here, since Tuck sent me one from Tostock in Suffolk during September, 1900; and both sexes have occurred to me in the same county at Eriswell, where I swept the new female from dry grasses, and at Tuddenham Fen, as well as at Edwinstow in Sherwood Forest, all during August.

5. EXALLONYX NIGER, Panz.

Codrus niger, Panz., Faun. Germ., viii, 1805, p. 85, pl. ix, ♂. *C. pallipes*, var., Nees, l.c., p. 357, ♀ ♂. *Proctotrupes nigra*, Spin., Ins. Lig., 1808, p. 168. *P. niger*, Latr., l.c., 1809, p. 38; Hal., l.c., p. 7, ♂ ♀. *Exallonyx niger*, André, l.c., p. 340.

Var. PALLIDISTIGMA, var. nov.—Under this name Chitty had ranged as a distinct species a number of specimens differing slightly from the typical form in having the stigma testaceous and quite remote from the apical abscissa of the radial nervure, leaving the radial cell comparatively broad. It is a good deal rarer than the ordinary form; Piffard has found it at Felden, Saunders at Reigate, Morey at Rookley in the Isle of Wight; I have taken it on the Felixstowe cliffs in Suffolk and swept it at Wicken Fen in Cambs.

Italy, Hungary, Switzerland, Germany, France, Sweden, etc. Not infrequent in woods during autumn; found by Walker and Haliday, presumably in both England and Ireland. Vollenhoven tells us (Pinac., p. 31) that it has been bred from the fungus-gnat, *Brachycampta griseicollis*, Staeg., which occurs in England. This is one of our most abundant species of the subfamily, though very rarely seen on the boulder-clay at Monks Soham and never on honey-dew; it is nearly always

taken by sweeping, usually in shady glades of woods in the afternoon, and I have dates from May 15th pretty continuously to October 5th. Rookley (Morey), Surrey (W. Saunders), Herts (Piffard), Suffolk (Tuck), Cambridge (Lyle), Derby and Notts (Carr), Yorks (Fordham). I have taken it at Newport, Ryde and Norton in the Isle of Wight, Lyndhurst, Wicken Fen, West Leake and Edwinstow in Sherwood, all over the light lands of Suffolk, at Killarney and on Clare Island in Ireland, and Elliott has sent it from Banchory in the Scots highlands.

6. EXALLONYX ATER, Nees.

Coirus ater, Nees, *l.c.*, p. 359, ♂ ♀. *Proctotrupes ater*, Hal., *l.c.*, p. 8; Voll., *l.c.*, p. 28, pl. xix, fig. 4. *Exallonyx filicornis*, Kief., André, *l.c.*, p. 341; *cf.* p. 325, ♂ ♀.

I do not consider Kieffer has satisfactorily demonstrated distinction between this species—which he did not know and places as insufficiently described in his subgenus *Cryptoserphus*, solely upon van Vollenhoven's (often faulty) authority—and that of Haliday, followed by Thomson. Frohawk, in the record noted below, refers to an apterous form of this species, but he does not make it plain whether it were an atrophied imago, like *Proctotrypes curtipennis*, or merely a pupa which had failed to attain maturity.

Germany, where Nees says it infests the larvæ of *Mycetophila* in fungi, particularly Boleti, about which he took it frequently in woods during October, as well as *in copula* on June 19th, 1810; Finmark and a variety in marine detritus in Heligoland. Ireland (Haliday) and England (Walker). Not very common with us; Olveston in Gloucester (Charbonnier); Ashfield Parva in Suffolk (Elliott); Wymondley in Herts (Butler), West Leake woods in June and September (Carr); Pakefield cliffs on sand and Lowestoft dunes among marram-grass; Brandon staunch, on long grass at Ousden, once at Monks Soham on under-side of lime-leaf at dusk, in Suffolk; and in Guestling wood near Hastings. It is on the wing from June 11th to September 24th. *Cf.* Frohawk's breeding at Eltham in Kent from the larvæ of the rove-beetle, *Creophilus maxillosus*, in the 'Entomologist,' 1886, p. 225.

7. EXALLONYX LIGATUS, Nees.

Codrus ligatus, Nees, *l.c.*, p. 359, ♀. *Proctotrupes ligatus*, Hal., *l.c.*, p. 8, ♂ ♀; Voll., *l.c.*, p. 31, pl. xix, fig. 9, ♀. *Exallonyx ligatus*, André, *l.c.*, p. 344.

From Sweden and France through Spain and Italy to Algeria; common on autumn fungi in woods; Vollenhoven records it from the British fungus-gnat, *Mycetophila punctata*, Mg. Very frequent everywhere; found in rotten seaweed, fungi,

etc., by Haliday and Walker. My dates are May 27th to October 27th, excepting July, by general sweeping and on reeds, on leaves of oak and lime, and house windows; at Foxhall, Hulver, Ipswich, Monks Soham, Wherstead, Bramford, Wangford, Covehithe, South Cove and Southwold in Suffolk. New Forest in May and September (Lyle); Lambley, Southwell and Nuttall in Notts (Carr); Oxshott (Newbery), Reigate (Saunders) and Kew (Sich) in Surrey. That it more likely preys upon some subterranean beetle than upon the above gnats is evidenced by Keys, who bred it at Plymouth in Devon on May 10th, 1909, from a mole's nest.

8. EXALLONYX LAEVIVENTRIS, Kief.

Exallonyx leviventris, André, Spp. Hym. Europ., x, p. 330,

♂ ♀.

England (P. Cameron); Austria (Trieste), Kieffer, *l.c.* I have seen no specimen of this subfamily with smooth second segmental base, though my search has been comprehensive.

9. EXALLONYX WASMANNI, Kief.

Exallonyx Wasmanni, André, Spp. Hym. Europ., x, p. 328,

♂ ♀.

The type form was taken with *Myrmica ruginodis* in Germany, and has not hitherto been known in Britain. The var. *socialis*, Kieff. (*l.c.*), differs in having the legs flavescent, and the radial cell one-third shorter than the stigma. This variety was discovered near London with the ant, *Lasius fuliginosus*, by Donisthorpe during September. The typical form is, however, found with us, for Chitty captured a male in the Faversham district of Kent on May 19th, 1906; but I have no doubt that it is rare, and probably confined to chalky places, since two females alone have fallen to my net, one during the following August at Ringstead Downs in West Norfolk, and the other on August 14th, 1908, as it was flying about the face of the sandy Corton cliff at Lowestoft on the Suffolk coast.

PARACODRUS, Kieffer.

André, Spp. Hym. Europ., x, 1907, p. 273.

This genus has usually been regarded as distinct from the broad genus *Proctotrypes* under the name *Codrus*, Jurine, which was restricted to it by Thomson in 1857; but, since it is really synonymous, the erection of *Paracodrus* must be accepted. The only other species of this genus, *P. albipennis*, Thoms., has been erroneously synonymised with the first, not known as British.

TABLE OF SPECIES.

- (2). 1. *Terebra* distinctly exserted; radial cell of ♂ short.
 1. *apterogynus*, Hal.
 (1). 2. *Terebra* not exserted; radial cell of ♂ elongate.
 2. *Bethyliiformis*, Kf.

1. PARACODRUS APTEROGYNUS, Hal.

Proctotrupes apterogynus, Hal, l.c., p. 15, ♂ ♀. *Codrus apterogynus*, Ashm., Bull. U.S. Nat. Mus., 1893, p. 344, pl. xiii, fig. 8. *Paracodrus apterogynus*, André, l.c., p. 276. (?) *Codrus apterogynus*, Voll., l.c., p. 28, pl. xviii, figs. 1 and 2, ♂ ♀.

That the female is sometimes fully winged has not before been noticed; this form differs in no way but in the thoracic modifications usual in such cases from the commoner apterous form, and the neurulation is exactly as in the male, which is by far the rarer sex. I find that I beat a specimen of the macropterous female from bushes in the village of Depden at the very highest point (420 ft.) of Suffolk on September 24th, 1907; and that the late Mr. Albert Piffard has given me a second, unnamed, collected by him at Felden, taken upon the top of a dry hill bearing such herbage as *Genista anglica*, etc., above Boxmoor station in Herts; though an example, labelled by Chitty "*astigmaticalis*, sp. nov.," was found by the latter on September 24th, 1904, in the Sheppy marshes of East Kent—perhaps an inland form, carried in the last instance by the wind.

P. apterogynus was originally discovered by Francis Walker near London and on the south English coast between June and September (Haliday). I have heard of no records later than 1839, and it is still unknown on the Continent. With us the species is distinctly uncommon, and my collection contains hardly a score of specimens captured between July 19th and October 7th; it is certainly an autumn insect, commonest in August and September. It has usually occurred to me in very marshy situations on *Lythrum salicaria*, by the river Gipping, at Ipswich, in 1898, by the Gipping at Claydon, in a marsh at Ashfield Parva and a moist wood at Wangford, near which it has several times turned up on the coast at Southwold and Easton. Other Suffolk localities are Corton, near Lowestoft, where it was running on bare sand, half way up the face of the cliff in 1898 (Elliott); Monks Soham, where it was swept in a pasture containing an old moat in 1909 (Newbery), and the Bentley Woods; Felden, in Herts, and Hursthill, in the New Forest (Morley); Malvern, in Worcester, during 1905 (Gorham); and Battle, in Sussex, during August, 1881 (Butler).

Nothing has hitherto appeared respecting its economy. The Irish National Museum in the autumn of 1919 sent me an apterous female of this species for determination, with the intimation that it had recently been bred along with identical

specimens from a larva of the Coleopterous genus *Agriotes*, found at Bangor, in Devon. This is valuable, for it enables us, with some degree of certainty, to ascribe to the present parasite the three old breedings of "*Proctotrypes*" from the same ubiquitous Elaterid genus: (1) William Kirby knew at 'Introd. Entom.,' 7th ed., 1859, p. 154, "the destroyer of the wireworm, which belongs to Latreille's genus *Proctotrupes*"; (2) Curtis, at 'Farm Insects,' p. 159, says the above parasite was from Starston, in Norfolk, and that the host was *Agriotes obscurus*, Linn. He adds, at p. 181, that he himself found two or three white maggots, and another had already pupated from which he could see that it was a *Proctotrypes* species; further, he quotes Bierkander in 'Communic. Bd. Agric.,' vol. iv, p. 414, who had a similar experience; (3) Curtis, at 'Farm Insects,' p. 198, refers to *Proctotrypes*-larvæ, figured at pl. G, fig. 46, protruding from a beetle larva, which he considers to be *Agriotes lineatus*, Linn., found during August, 1841, in Surrey. In a general way I consider that all the more reliable of our records point to the parasitism of the PROCTOTRYPINÆ upon Coleoptera rather than upon Diptera, as was supposed by the older authors. On the other hand, there can be no doubt that Diptera are the staple hosts of our next subfamily, the BELYTINÆ.

2. PARACODRUS BETHYLIFORMIS, Kieff.

The terebral length of this insect appears hardly a specific character; the radial nervure of the present genus is so weak as to be difficult to trace, and Kieffer gives no distinction from *P. albipennis*, Thoms.; moreover, the fact that he did not know *P. apterogynus* renders it far from improbable that all three are no more than forms of a single species. *P. bethyliformis* is simply recorded thus: "England (P. Cameron)," by its author.

Monks Soham House, Suffolk;
March 10th.

NOTES AND OBSERVATIONS.

Lycæna adonis in Bucks, and an Appeal.—When at Folkestone in September, 1920, I sent about a gross of living females of *L. adonis* to friends to be liberated in suitable localities on the Oxon, Bucks and Herts Chilterns. The Bucks ground in particular appears to be well suited to the species' requirements, as there it is increasing in numbers with each brood and also spreading. Might I earnestly appeal to collectors not to take the insects, especially the females, before the autumn of 1923, so as to give *adonis* a chance to become firmly established. It seems necessary to make this request as I understand a London entomologist has already been down to Princes Risborough this spring and taken away about 200 specimens. This quantity at a time when the butterfly is endeavouring to secure a footing is a serious matter. I may here mention that *Lycæna*

corydon was again a great rarity in 1921. On the old var. *Syngrapha* ground (where the Royston females were put out in 1920) I saw on various days only about fifty males and not any females, and, of course, no varieties whatever.—G. B. OLIVER; High Wycombe.

COLIAS CROCEUS IN BUCKS.—A fresh male of *C. croceus* was taken on June 1st and a very worn female on the 11th.—G. B. OLIVER.

C. CROCEUS, ETC., IN SUFFOLK.—On June 8th I saw a *C. croceus* flying along a dusty road here (another, or probably the same one, reported same day in neighbourhood). *E. cardamines* were well out here on May 7th and are still flying fresh and strong to-day.—H. W. BAKER; 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk, June 16th, 1922.

COLIAS CROCEUS IN CAMBRIDGESHIRE.—On May 24th I saw two specimens of *C. croceus* near Cambridge and on the following day several specimens in a different locality. This is an early appearance compared with some of the records from the south coast in the July number of the 'Entomologist.'—A. D. TORLESSE (Sub.-Lieut., R.N.); Holywood, Lymington, Hants.

COLIAS CROCEUS IN LINCOLNSHIRE.—I think it may be of interest to record that on June 4th I took two specimens, both females rather worn, of *Colias croceus*; and on June 14th I took a third *croceus*, also a female and rather worn. I netted these three specimens within two miles of my house.—G. T. PIGOTT (Major); Somerby, Barnetby, Lincolnshire.

COLIAS CROCEUS IN S. SHROPSHIRE.—It may be interesting to you to know that on June 5th (Whit-Monday) three specimens of *Colias croceus*, one male and two females, were caught in South Shropshire, one by myself and the other two by my little boy of seven and a half. Also last year and the year before *Vanessa c-album* were very fairly common in this district.—(Rev.) P. MALDEN; The Vicarage, Cleobury Mortimer, Salop.

COLIAS CROCEUS IN WORCESTERSHIRE.—On Sunday, June 4th, whilst out picnicking near Studley, Worcestershire, my son Allan, aged thirteen, wandered off with my net and returned with a female Clouded Yellow, very much worn. Is not this a rather unusual species for the district? Although I fancied I saw one in the same field last year it had escaped my memory. I shall work the district well later on, hoping to find the progeny of this capture.—CHAS. WEARE; Drayton House, King's Heath, Birmingham.

COLIAS CROCEUS IN GLAMORGAN, ETC.—Two specimens of this butterfly were seen in flight at St. Fagan's, near Cardiff, on June 5th. Later in the month (June 11th) four were seen in the same district. Of these three were taken, the insects being males, and all perfect. Just over the county border near St. Mellon's, Monmouthshire, I saw a further specimen in flight on May 27th, 1922. This butterfly was frequently seen in 1901 near Cardiff, but I did not after this see it locally for eleven years. About six specimens were seen in August of 1920 at Sully but none were seen by me last year.—T. J. SHELLEY; 5, Wishwell Road, Cardiff, South Wales.

P. DAPLIDICE AT BRIGHTON.—I write to inform you that on Sunday, June 4th, about 1 p.m., my eldest son caught a Bath White Butterfly (*P. daplidice*) in our front garden, which is in the centre of this town and a few hundred yards from the sea. The fly had settled upon a pansy at the time of its being caught. The insect is in perfect condition and has doubtless not been long out of the pupa. I understand that this fly is one of the rarest in England and is rarely taken in this country. A local amateur collector in this town, Mr. Purbrook, of Upper North Street, has seen the fly and has set it, and confirms the fact that it is a genuine specimen.—B. J. HOLLEYMAN; Sea View House, Crown Street, Brighton.

CELERIO LINEATA LIVORNICA, ESP., IN THE ISLE OF WIGHT.—A ♂ specimen of this Sphingid was taken at Sea View in a crevice of a wall on May 2nd, 1922. The insect was captured by Mr. Bennett, gardener to J. J. Joicey, Esq., in whose collection the specimen now rests.—G. TALBOT; The Hill Museum, Witley.

SPHINX CONVULVULI IN HERTS.—A friend has just shown me a specimen of *Sphinx convolvuli* caught in his garden to-day at rest. The specimen, however, is unfortunately worn. I should also like to mention that, though some insects have appeared late this season, I have some quite early records; *P. rapae*, April 21st; *P. brassicae*, *P. napi*, and *H. malvae*, May 6th; *Phragmotobia fuliginosa*, May 7th—this specimen has very little dark colouring on hind wings; *Spilosoma menthastri*, May 26th—a pair which laid a large number of eggs on May 28th to 30th which have hatched between June 5th and 14th.—R. B. BENSON; Boldre House, Berkhamsted, Herts, June 15th, 1922.

SPHINX CONVULVULI IN CAMBRIDGESHIRE.—I captured a fine specimen (male) of *Sphinx convolvuli* on honeysuckle here on the evening of June 7th last. I believe it has very seldom been taken so early in the year.—A. HAROLD RUSTON; Aylesby House, Chatteris, Cambs.

SPHINX CONVULVULI IN DERBYSHIRE.—You may like to have a note for the 'Entomologist' of the occurrence here of a fine specimen of *Sphinx convolvuli* on the 10th of this month. Records of *convolvuli* in June are not unknown, I am aware, but I fancy they are very scarce, nor do I know quite how they are accounted for.—H. C. HAYWARD; Repton, Derby, June 14th.

HELIOTHIS ARMIGERA IN KENT.—I should like to record that on June 21st I captured near Bexley, Kent, a specimen of *Heliothis armigera*, as it was flying rapidly round a clump of valerian.—M. MACTAGGART; Moorcroft, Gravel Hill, Bexley Heath, Kent, July 3rd, 1922.

CYDIA CITRANA, HB., NEAR WANSTEAD.—Last evening I walked over to a rough field some two miles away to search for *Platyptilia bertrami* amongst a dense growth of Yarrow. I netted a few, but they were all too bleached to be of any use. When on the point of leaving I disturbed a pale-coloured *Tortrix* which I thought was *Phalonia smeathmanniana*. As it was too late for the first brood and rather too early for the second I netted it and was surprised to find that it was *citrana*—a worn male. Directly after I netted another male, also worn. I have never seen it in this district before, and I

think its occurrence so close to London worthy of record.—A. THURNALL, Wanstead; Essex, July 12th, 1922.

NEMOTOIS MINIMELLUS, Z., ETC., IN GLOUCESTERSHIRE.—It may be of interest to record that I took a fine male *Nemotois minimellus* at rest on a flower of Sneezewort (*Achillea pharmica*) in a field near Gloucester where the Devil's Bit—Scabious (*Scabiosa succisa*)—grows, on August 11th, 1921. On the same date *Lycaena arion* was reported on our hills by Master Russell Brotherton. This was probably a case of retarded emergence and not a second brood.—C. GRANVILLE CLUTTERBUCK, F.E.S., 23, Heathville Road, Gloucester.

LEPIDOPTERA IN THE SWANAGE DISTRICT.—It may be of interest to record the many species of butterflies met with in the Swanage district during the past week-end. The weather was all that could be desired, and the Purbeck hills and valleys were looking glorious in their wealth of summer foliage. The hills running from Ballard Down to Corfe Castle form the ground that gives the best results. Here were found *L. icarus* swarming, a few worn *L. adonis* and males of *A. cardamines*, which were very plentiful, and were flying with a host of *P. brassicae* and *P. rapae*. *A. euphrosyne* were in fine condition, but not abundant; *Z. minima*, *H. malvae* and *T. tages* were very common all along the bottom slopes, and were almost as numerous in the quarry lands to the south. Females of *C. edusa*, *P. atalanta* and *P. cardui* were all ovipositing, and it looks as though these species will be in plenty later. *P. aegeria* and *P. megaera* were very worn but in fair numbers, *C. phlaeas* and *C. pamphilus* were in prime condition, but *L. astrarche* was going over. *C. argiolus* were flying very freely and quite fresh. A new place for *C. rubi* was stumbled upon by accident and they were flitting about in scores. Not a single specimen of *G. rhamni* was met with nor *A. actaeon*, for although the text-books say July, I have generally taken a few of the latter in June. Larvæ of *M. galatea* and *S. semele* were scarce, but *V. urticae* plentiful, and only two *T. quercus* were secured for thirty minutes' beating. Unfortunately time would not allow my visiting the home of *L. sibylla* and *T. fuciformis* where these species occur abundantly but in a restricted area.—LEONARD TATCHELL, F.E.S.; Wanstead, June 15th, 1922.

SPRING RHOPALOCERA IN SURREY.—I thought the following list of species of British Rhopalocera seen or taken between May 19th and June 4th in Surrey within a radius of twenty miles of London would be interesting to readers of the 'Entomologist': *C. argiolus* (common), *P. rapae*, *P. napi*, *P. brassicae*, *E. cardamines*, *G. rhamni*, *V. io*, *V. urticae*, *P. atalanta*, *P. cardui*, *V. polychloros*, *H. malvae* (common), *C. phlaeas* (scarcer than usual), *T. tages* (common), *T. rubi* (local), *N. lucina* (abundant), *L. astrarche*, *L. icarus* (common), *L. bellargus*, *A. euphrosyne* (common), *C. pamphilus* (common), *P. megaera*, *A. sylvanus* and *C. croceus*. I also took a fair series of *P. egeria* from Bucks on May 14th, making a total of twenty-five species in all. The specimen of *C. croceus* is a female in very good condition. I shall be interested to hear if any reader can exceed this total for the same period for the county of Surrey—twenty-four species.—AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, London, S.W. 14.

VARIETIES OF *BRENTHIS EUPHROSYNÉ* AND *THECLA W-ALBUM*.—I should like to record some remarkable colour varieties of butterflies from the Chilterns. In 1920, in a certain wood, I secured a specimen of *Brenthis euphrosyne* having the underside of a deep, almost uniform russet, with dull leaden instead of silvery metallic spotting; also three other specimens of tints ranging back to the type. This year, from about twenty bred specimens, one has emerged of this same form, whilst the wild captures include another, very extreme, two intermediate forms and two with creamy undersides. Strangely enough in all these specimens the uppersides are nearly or quite typical. The first *euphrosyne* seen in 1921, in a small copse some few miles from the wood above alluded to, is probably the strangest specimen of them all. The whole insect, upper and underside, is toned a purplish-mahogany colour, the border metallic spots being magenta-tinted and small. A specimen secured this year has the upperside somewhat similar with typical underside; another has a dull tawny upperside with underside of an olive-grey tint. All these varieties are males. In 1919 I beat five full-fed larvæ of *Thecla w-album* close to High Wycombe which produced the same number of butterflies, one of which I think must be unique. Its colour, both upper and underside, is golden khaki, rather similar to the khaki form of *Lycaena corydon* (♀) occurring at times at Royston and elsewhere. Other less important varieties met with are pale *C. pamphilus* and golden *H. linea*.—G. B. OLIVER; High Wycombe, June 15th, 1922.

C. PHLÆAS, VAR.—On May 28th last, when taking Lepidoptera at Horsley, Surrey, I netted a rather unusual specimen of *C. phlaeas*. The fore wings are a bright golden colour, deeper at the base and gradually getting to a paler shade towards the margins, the hind wings as in typical specimens, but with row of blue spots as in var. *caeruleo-punctata*. The specimen, which is a perfectly fresh one, is still paler in colour when looked at at an angle, being distinctly primrose in shade. I have never seen a specimen exactly like it before; the pale golden specimens I have seen have had the band in the hind wings also of that colour, which is not the case with this specimen.—AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

HYBRIDISATION IN NATURE.—On June 10th, in a marshy field, I took at rest on a grass stem a pair of moths. The female was *Z. trifolii*, newly emerged, and the male was *A. statices* in somewhat worn condition. They remained "*in cop*" for about half an hour only, the female being rather restless. Up to the time of writing no eggs have been laid. *A. statices* was this year fully a fortnight earlier than *Z. trifolii*, which is only just beginning in this particular field. The observation seems interesting as affording evidence of the close relationship between the two families.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

CANNIBALISM AMONG *CUCULLIA VERBASCI*.—On June 23rd I found some of the larvæ of *Cucullia verbasci* on a plant of great mullein. I placed them in a zinc larva cage, and gave them a good supply of the leaves of mullein. On the following day one of them was seen

to attack another with wide open mandibles, and on reaching it killed and devoured it. The same thing happened with another brood of the same. The remainder of the first lot pupated on July 8th and 9th; those of the second are still feeding but will soon, I think, spin up. Has cannibalism been known to occur before with this species?—L. H. BOND; The Cottage, Welby Gardens, Grantham, July 13th, 1922.

A NOTE ON *HELICONISA PAGENSTECHERI* (SATURNIDÆ).—(Extracted from letters from F. B. Hinchliff, Estancia "Los Flamencos," Sancti Spiritu, F.C.C.A. Argentina. March 1st, 1922.) "For the last thirty years I have occasionally seen what I always thought was a kind of *apollo* owing to its flight and transparency of wings. I have seen three or four specimens *only*. The flight is a floppy and irregular one—something like a big white or swallowtail, a distinct *butterfly* flight—and they very rarely alight. I only saw two alight—wings closed like a moth (*Noctua*), the female with wings closed like a 'drinker' moth. They only fly by day for a short period. I found them at the best between 2 and 4 p.m., and when I rode up to the house to get some more papers and got back to the hunting-grounds at 4.45 they had all gone to roost. I could have sworn when I saw them on the wing that they were butterflies, and was quite nonplussed when I saw them on the grass with wings posed like moths. I caught one female and one male in the act of mating—otherwise I should never have believed that they were male and female. An interesting feature about these Argentine specimens is that *to-day* once the moth settled in the dead grass it was impossible to put it up again, evidently it crawled down into the masses of dead grass and there it roosted until the next afternoon. The grasses where I caught it were about 3 to 4 ft. deep. The males settled very occasionally on the dead grass, which, being straw colour, acted as a good 'camouflage,' and once they pitched they were not to be put up again. I marked one specimen down and never put him up, and to find him was like looking for a needle in a bundle of hay. Although the males fly with a floppy flight they go very quickly—though apparently lazily. Having discovered their breeding-ground (they feed on coarse grass about 3 to 4 ft. high) I can catch any quantity next year if required.—This afternoon, 3 p.m. there must have been 300 to 400 males on the wing in 20 acres of pasture, and having noted the date I will be ready for them next year. Personally I should never have thought that the butterfly-looking specimens were moths, as in the sun they looked as if their wings were made of silver, or glass, or celluloid, and the sun shining on the wings made them flash. The caterpillars evidently feed on grass, and I shall keep that island [on which the moth occurred] as a sanctuary of the moth. I found it useless running or trying to run after them in the tall growth so I simply waited until one flew near me, when I made a dash at it. Of course I missed quantities, as they are very quick and dodging, and I only had the small folding net you sent me. The female never attempted to fly—too heavy in body."

In a letter dated April 18th, 1922, he writes: "I wonder what they (these moths) feed on, as they never *once* pitched on a flower, though there were lots of big thistles in full bloom all over the place.

I think it must have been the females that I saw several times flying low and fast over the lake, every now and then dropping on to the surface, like a swallow, and having a drink. It was a dark brown moth about the same size as the one I sent you, and close to the spot on the lake where I saw two or three moths drop on to the surface for a drink, and then off again—very quick flyers."


In a further letter dated June 11th, Mr. Hinchliff writes:—"Re my remark that I had discovered their breeding-ground, what I meant was that I had discovered the locality where they evidently bred, as it is the only spot where there were several of them flying about; before, I had only seen single isolated specimens flying over the pampas, but here, on this island, there were some hundreds flying over a given spot about twenty acres or so in extent composed wholly of coarse grass about three feet high (tussocks, called red grass or *paja colorada*), a few plants of pampas grass with the tall white bloom stalks, some tall thistles, and a few small weeds and a variety of small grasses, including a brome grass the same in appearance as the grass on the sand-dunes at Braunton Lighthouse. There were no shrubs or reeds or trees of any kind and they only hovered over the red grass—so-called because in the winter the old leaves turn a reddish colour sometimes. The whole place is two feet deep with dried, rotted leaves of this grass, and occasionally they seemed to disappear mysteriously into it, as the one I caught was in it, and the female was also on a dry blade of the same grass. There is a kind of loosestrife in this country and perhaps there may be some plants there, but next season I will look out for the caterpillars on all the different weeds I can find. Anyhow, I will make a point of trying to find them and will do as you request, taking a careful note and drawing of them in the event of being successful."—G. F. MATHEW; Lee House, Dovercourt, Essex.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*May 11th, 1922.*—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. C. B. Leechman, of Purley, was elected a member.—Mr. H. Main exhibited *Thais polyxena*, bred, from Hyères, and some wingless sand-beetles—*Pimelia angulata*—from Egypt.—Mr. E. Step, a large gall on *Populus alba* from France, with small Diptera (*Cecidomyia*, sp.), which had emerged, and much smaller hymenopterous inquilines. He also showed larvæ of the lichen-feeding Geometer, *Cleora lichenaria*.—Mr. H. Moore, Lepidoptera from New Zealand, including *Vanessa gonerilla*, *Chrysophanus salustius*, etc.—Mr. R. Adkin exhibited the "brown-tail" and "gold-tail" moths, discussed their names, pointing out that the former should be called *Nygmia phaeorrhoea* and the latter *Leucoma chrysorrhoea*.—Mr. Staniland, the beetle *Melanophila acuminata* from Suffolk.—Mr. Blair, for Mr. Dods, the "stick-insect," *Baurosia morus*, of an unusual red-brown colour.—Mr. Turner, the Brazilian Longicorn *Phoenicocerus dejeanii*, which has the antennæ furnished with extraordinarily long lamellæ.—HY. J. TURNER, *Hon. Editor of Proceedings.*

EXCHANGE

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

 **NOTICES OF EXCHANGE** should be received by the 21ST OF EACH MONTH to insure insertion. Not more than **SIX LINES** can be allowed for each.

Duplicates from Southern Spain.—*T. rumina*, *E. belemia*, *E. euphonides*, *T. ilicis* (var. *œsculi*), *L. telicannus*, *S. fidia*, *P. ægeria* (Southern form), *E. janira* (var. *hispulla*), *E. ida*, *E. pasiphæ*, *C. edusa*, *L. sinapis*, *Z. boetica* (Burnett). The foregoing in papers, with data: *E. cribrum*, *E. pudica*, *A. crassa*, *P. chalcites*, *H. crinalis*, *A. imitaria*, *S. sacaria*, *M. unionalis*, *A. marginepunctata*, *D. saportie*, *L. putrescens*, *A. clavipalpis*, *H. japygiaria*, *G. mucidaria* and a few others, all set, black English pins, full data. What offers in British Lepidoptera, good condition, well set, with data?—*Major J. J. Jacobs, Holmesleigh, Burgess Hill, Sussex.*

Duplicates (unset).—*Rapæ*, *Euphrosyne*, *T. rubi*, *Menthrastris*, *Jacobæa*, *Rurea* and varieties (worn), *Exclamationis*, *Polyoden*, *Pronuba*, *Rumicis*, *Gothica*, *Strigula*, *Sociata*, *Multistrigaria*, *Montanata*, *Petraria*, *Inteolata*, *Tristata*, *Plumbaria*, *Suffumata*, *Fluctuata*, *Atomaria*, *Filipendulæ*,* also ova *B. quercus* var. *callunæ*, and larvæ *Jacobæa*. *Wanted.*—Very numerous, especially *Cassiope*, *Hawks*, *Tigers*, *Prominents*, etc., also larvæ, pupæ.—*James N. Pickard, Brow Top, Quernmore, Lancaster.*

Duplicates.—Larvæ: *Vinula*, *Carpini*, *Glaucia*, *Camelina*, *Verbasci*, *S. ligustri*, *Betularia* (melanic), *Galiata*, etc. Pupæ: *Munda*, *Cruda*, *Badiata*, *Multistrigaria*. Imagines: *Strigilis* (melanic), *Monoglyphia* (melanic), *Tristata*, *Propugnata* and many others. *Desiderata.*—Numerous to end of Tortrices.—*Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.*

NATURELAND

An Illustrated Magazine of Natural History.

The Magazine you have been waiting for
The Magazine that is different

PAPERS REVIEWS NOTES PHOTOGRAPHS

Prospectus from the Editor—

Dr. GRAHAM RENSHAW, Bridge House, Sale, MANCHESTER.

CHANGE OF ADDRESS.—Mr. R. T. Bowman, from 68, Mornington Road, Chingford, to 17, Frederica Road, Chingford, E. 4.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, October 4th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. *Hibernia Chambers, London Bridge, S.E. 1.*—Ordinary Meetings, *Thursdays, August 10th and 24th, at 7 p.m.*—Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.

CONTENTS.

Parasemidalis annie, Enderlein, a Coniopterygid New to Britain, with Notes on some other British Coniopterygidæ, *C. L. Withycombe, B.Sc., F.E.S.*, 169. Co-ordinated Rhythm in Insects; with a Record of Sound Production in an Aphid, *C. B. Williams, M.A., F.E.S.*, 178. A New Fossil Longicorn Beetle, *T. D. A. Cockerell*, 176. Some Curious Aberrations of *Danaüs chrysippus*, *L., Capt. Kenneth J. Hayward, F.E.S.*, 178. The Life-Cycle of *Penthina sorculana*, *Zett., W. G. Sheldon, F.Z.S., F.K.S.*, 179. A Synopsis of British Proctotrypidæ (Oxyura) *Claude Morley, F.E.S., F.Z.S. (continued from p. 161), 182.*

NOTES AND OBSERVATIONS.—*Lycæna adonis* in Bucks, and an Appeal, *G. B. Oliver*, 186. *Colias croceus* in Bucks, *G. B. Oliver*, 187. *C. croceus*, etc., in Suffolk, *H. W. Baker*, 187. *Colias croceus* in Cambridgeshire, *A. D. Torlesse (Sub-Lieut., R.N.)*, 187. *Colias croceus* in Lincolnshire, *G. T. Pigott (Major)*, 187. *Colias croceus* in S. Shropshire, (*Rev.*) *P. Malden*, 187. *Colias croceus* in Worcestershire, *Chas. Weare*, 187. *Colias croceus* in Glamorgan, etc., *T. J. Shelley*, 187. *P. daplidice* at Brighton, *B. J. Holleyman*, 188. *Celerio lineata livornica*, *Esp.*, in the Isle of Wight, *G. Talbot*, 188. *Sphinx convolvuli* in Herts, *R. B. Benson*, 188. *Sphinx convolvuli* in Cambridgeshire, *A. Harold Ruston*, 188. *Sphinx convolvuli* in Derbyshire, *H. C. Hayward*, 188. *Heliothis armigera* in Kent, *M. MacLaggart*, 188. *Cydia citrana*, *Hb.*, near Wanstead, *C. Granville Clutterbuck, F.E.S.*, 189. Lepidoptera in the Swanage District, *Leonard Tatchell, F.E.S.*, 189. Spring Rhopalocera in Surrey, *Augustus E. Stafford*, 189. Varieties of *Brenthis euphrosyne* and *Thecla w-album*, *G. B. Oliver*, 190. *C. phleas*, var., *Augustus E. Stafford*, 190. Hybridisation in Nature, *Wm. Farnidge*, 190. Cannibalism among *Cucullia verbasci*, *L. H. Bond*, 190. A Note on *Heliconia pagenstecheri* (Saturniæ), *G. F. Mathew*, 191.

SOCIETIES.—The South London Entomological Society, 192.

G. A. BENTALL, Naturalist,
392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

Palæarctic, Indo-Australian, African, American Lepidoptera and other Insect Orders. Apparatus and Books.

— A — REVOLUTIONARY

Method of Collecting and Preserving all Forms of Small Insect Life—
 without in any way injuring the specimen—

“THYMO-PLAS.”

The specimen is placed in an air-tight cell formed by a ring of “Thymo-Plas” and transparent covers. Complete Outfits 3/6 and 6/9 post free.

Full particulars and directions by Dr. Alfred Moore, F.E.S., on receipt of stamp.

HARBUTT'S PLASTICINE Ltd., 48, Bathampton, BATH.

Vol. LV.]

SEPTEMBER, 1922.

[No. 712.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

N. D. RILEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.
36, Strand, London, W.C.2.

STEVENS'S AUCTION ROOMS, LTD.

[Established 1760.]

To be Sold by Auction on Tuesday, September 19th, 1922, at 12.30,

The Collection of **British Lepidoptera, Coleoptera, Hymenoptera, Homoptera, Exotic Lepidoptera** and other **Insects**, formed by the late **V. R. PERKINS, Esq.**, arranged in five Mahogany Cabinets and 50 Store Boxes.

Also a large number of other **Exotic Lepidoptera**, including many rare varieties, Mahogany and Oak Cabinets, etc.

Catalogues on application to

38, KING STREET, COVENT GARDEN, W.C.2.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of **BRITISH LEPIDOPTERA**. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

THE ENTOMOLOGIST.

VOL. LV.]

SEPTEMBER, 1922.

[No. 712

ON THE IDENTITY OF *SYMPHEROBIUS* (*HEMEROBIUS*) *ELEGANS*, STEPHENS (NEUROPTERA).

By C. L. WITHEYCOMBE, B.Sc., F.E.S.

In the 'Entomologist' for August, 1914, Mr. K. J. Morton dealt with two species of *Symphherobius* which had been for some time mixed in British collections under the name of *elegans*, Stephens. One of these is smaller than the other and has whitish interruptions on the dark brown veins in the fore wings, while the other and larger species has the fore-wing venation uniformly dark brown. MacLachlan, in his "Monograph of the British Neuroptera Planipennia" ('Trans. Ent. Soc. Lond.,' 1868), gave an account of the species with the white dotted veins, but attributed to it the name of *elegans*, Steph., although Stephens's description plainly refers to the anterior wings as being wholly dark fuscous. MacLachlan makes no comment on this discrepancy between the original description and his own, although it is to be assumed that Stephens's description and type were both known to him.

With the object of determining the proper application of the name *elegans*, Mr. Morton sent to Mr. Herbert Campion specimens of both the species of *Symphherobius* in question, for comparison with the type material in the Stephens Collection at the British Museum (Natural History). Mr. Campion was of opinion that the larger and darker species was the true *elegans* of Stephens, but said he preferred to await confirmation of his identification by someone who had made a special study of the group, before alleging against MacLachlan so strange an error as had seemingly been committed. In the circumstances, therefore, Mr. Morton decided provisionally to retain for the smaller variegated species the name *elegans*, Stephens, while employing the name *striatellus*, Klapálek, for the larger and uniformly dark species.

A short time ago, whilst working through Stephens's Collection at the British Museum, I found to my surprise that the *elegans* of Stephens was undoubtedly the wholly dark species, that is, *striatellus*, Klap. Stephens's Collection contains no representative of the white-dotted form, and therefore there can have been no confusion of types. His type of *elegans* agrees

with his description entirely, and is clearly not the species regarded by MacLachlan as *elegans*. *S. elegans* of Stephens is the larger form, with the veins entirely dark fuscous, as stated in his description ('Ill. Brit. Ent.,' Mand. vi, p. 113, 1836), and is therefore synonymous with *striatellus*, Klap. Other specimens of the same species were labelled by Stephens as *marshami* and *beckwithii* respectively.

Having determined the larger species as *elegans*, Steph., it is now necessary to find a name for the smaller form, and I think we shall be safe in accepting Morton's suggestion and adopting the designation of *S. pygmaeus*, Rambur. Rambur's description ('Ins. Névropt.,' p. 442, 1842) leaves the species somewhat ill-defined, but Brauer's later diagnosis ('Neuropt. Austr.,' p. 56, 1857) admits of no doubt, at all events, as to his conception of Rambur's species.

The following comparison is adapted from Morton, and amply serves to separate the two species under consideration :

Face dark shining piceous; dorsum of thorax also brown; neurulation of fore wings entirely fuscous without interruptions, these wings heavily marked to the wing base, the markings more or less radiate, especially those proximal to the midline. Absence of gradate veinlets, those in the distal part of the wing much broken up into irregular dots; gradate veinlets usually heavily shaded. Larger darker species.

elegans, Stephens (= *striatellus*, Klap.).

Face and dorsum of thorax yellowish; neurulation of fore wings with pale dotted interruptions; dark markings on outer half of fore wings mostly placed opposite each other on either side of the dark portions of the longitudinal veins. A pale space at the base of these wings in which the veins are rather indistinct, the transverse veinlets being hardly visible. Paler smaller species.

pygmaeus, Rambur.

ON THE EARLIER STAGES OF *CACOEZIA* *CRATAEGANA*, HÜBN.

BY W. G. SHELDON, F.Z.S., F.E.S.

In the month of June, 1917, searching for larvæ and pupæ of *Peronea boscana* on elm at Brockenhurst, I found a pupa spun up in an elm leaf which produced a male specimen of *Cacoecia crataegana*, generally supposed to be attached to oak. Three years later, at the same period of the year, I beat out of elm at Brockenhurst several very large, dark olive green, almost

black, tortrix larvæ, which I did not recognise, and from them had the following month imagines of *C. crataegana*.

The larva being now recognised I made an excursion to the New Forest in June, 1921, to secure a supply, which I obtained from oak, elm and sallow.

This larva is not readily to be mistaken for that of any other species; the only one resembling it in any way is *C. sorbiana*, but this latter is an earlier larva, being usually full grown when that of *C. crataegana* is only about half its eventual size; in addition the full-grown larva of *C. sorbiana* is much lighter olive green, and has a brown prothoracic plate. It is admirably figured by Snellen in 'Nederlandsche Insecten,' vol. iv, pl. xlviii, figs. 1-3.

The following is a description of *C. crataegana* in the final instar: Head and prothoracic plate black and glabrous without the conspicuous white collar which is a prominent feature in *C. sorbiana*, although a narrow one is discerned when the head is bent downwards. The segments at the rear of the prothorax are in colour very dark olive green, almost black (quite black in the previous instars) and somewhat spiny. The tubercles are rather prominent and black in colour; the larva is somewhat transparent, the alimentary canal being discernible. The anal plate is very black and chitinous, with a rough surface; the prolegs are intensely black; the claspers and ventral area are of a lighter olive green than the dorsal area. The larva tapers towards head and anal extremity; it rests with the head flattened out.

The male pupa is 9.5 mm. long by 3 mm. broad, the female pupa being 13 mm. long by 4.5 mm. broad. The head is blunt and rounded, without a cocoon opener. The wing cases are black and glabrous, striated longitudinally, the head, antennæ and eye covers are prominent and raised. The abdominal segments are very dark brown, almost black, not glabrous; the wing-cases reach to the rear of the second abdominal segment. The pupa terminates anally in a long-drawn-out point which has at the extreme end four hooks, and at the base of the anal segment four others arranged in pairs. Each abdominal segment is armed with rows of spikelets and a number of long spines, two pointing rearwards; the abdominal segments are reticulated on the surface.

Youlgreave,
South Croydon;
July 31st, 1922.

[We very deeply regret to have to announce the death, on Sunday, August 27th, of Dr. DAVID SHARP.]

A NEW *CALLIMORPHA* FROM NORTH-WEST PERSIA AND ARMENIA.

BY W. H. T. TAMS.

Callimorpha quadripunctaria splendidior, subsp. nov.

Callimorpha quadripunctaria (Poda), Watkins and Buxton, Journ. Bombay Nat. Hist. Soc., xxviii, p. 178 (1921).

♂ and ♀. General pattern and colour scheme as in *quadripunctaria quadripunctaria*, Poda, than which it is somewhat larger. Palpi: 1st and 2nd segments pale yellow, the 2nd with a blackish spot outwardly near base; 3rd blackish. Antennæ sepia. Head pale yellow, with two black spots on vertex behind antennæ. Patagia and tegulæ bright bronze green edged with yellow. Thorax pale yellow with a median longitudinal bronze green stripe. Abdomen rosaceous orange above, with a small black spot on each segment. (Black spots sometimes absent, as in holotype ♂.) Pectus and underside of abdomen pale yellow, the latter bearing a row of black spots on each side, and a median longitudinal row. Fore and middle legs pale yellow, the tibiæ and tarsi with sepia bands above. The hind legs pale yellow. Fore wing with the pattern of *quadripunctaria*, from which it differs as follows: Colour brilliant bronze green, with the pale yellow bars more ample; a small pale yellow spot on vein 2, near middle; a pale yellow streak along the basal two-thirds of the anal vein, broad basally, its attenuated extremity joined to the broad pale yellow border of the inner margin. Fringe alternately sepia and pale yellow from apex to two-thirds; remaining third pale yellow. Hind wing and whole of underside as in *quadripunctaria*, but with blackish markings reduced.

Holotype ♂ and allotype ♀: Harir (5300 ft.), N.W. Persia, 11.8. '18 (H. D. Peile).

Paratypes: 4 ♀ ♀, Harir (5300 ft.), N.W. Persia, 10-11.8. '18 (H. D. Peile). ♂ and ♀, Karind Gorge (6000 ft.), N.W. Persia, 14.7. '18 (Peile). 4 ♂ ♂ and ♀, Mungerrah Mts., near Dizful, Persia, 1856 (W. K. Loftus). 2 ♂ ♂ and ♀, Suwara (4000-4600 ft.), 60 miles north of Mosul, Armenia (Capt. Aldworth).

The above specimens are all that I have so far seen, and are in the collection at the British Museum (Natural History).

Col. H. D. Peile says: "July 13th to August 19th, 1918. In large numbers settled on leaves of trees a few feet from the ground, easy to catch; August 10th, abundant still, but more females; 19th August, nearly over."

This very distinct form is in its outstanding features quite constant throughout the series of 16 specimens. It is easily distinguished from *quadripunctaria*, Poda, by its bright bronze green colour, larger size, and by the very long pale yellow streak on the anal vein of the fore wing.

It will be interesting to discover its western limits, as *quadripunctaria quadripunctaria* occurs in Syria. There is a specimen in the National Collection from the Amanus Mts., near Alexandretta, and the Armenian specimens of *splendidior* were taken 600 miles due east of this, beyond the Tigris.

Brit. Mus. (Nat. Hist.),
S. Kensington.

ON A NEW SPECIES OF GENUS CALPE FROM JAPAN.

By A. E. WILEMAN.

IN the National Collection of the British Museum (Natural History) there are three specimens of a new *Calpe* which have hitherto been included in the series of *Calpe minuticornis*, Guenée, but have now been separated and are unnamed, one male from Chang-yang, West China (A. E. Pratt, July, 1888), and two females labelled "Hakodate" and "Yezo" (Andrews) respectively. Hakodate, I may state, is situated in the Island of Yezo, now more commonly referred to by Japanese as Hokkaidō, so that both these Japanese specimens hail from Hokkaidō, or Yezo. In the same series there is also exhibited an inflated larva of *minuticornis* (ex Green Collection, Ceylon), coloured figures of the larva and pupa drawn by Moore, and a preserved pupa shell from the Moore Collection. Moore also figures and describes the larva and pupa of *minuticornis* in 'Lepidoptera of Ceylon,' vol. iii, p. 78, pl. cliii, fig. 3, imago; fig. 3a, larva; fig. unnumbered, of pupa, 1884-7.

I have in my Japanese collection four specimens of this new *Calpe*, which agree well with the above-named three specimens of the British Museum series, namely, two males bred at Hakodate, Hokkaidō, on August 6th and 7th, 1902; one male bred at Hakodate probably about the same time as the two preceding males; and one female received at Hakodate in 1902 from the Right Rev. Bishop Andrews, Bishop of Hokkaidō, taken by him in Hokkaidō, but neither dated nor localised. One of these four specimens was bred from a larva painted by a Japanese artist on July 8th, 1902, whom I employed at Hakodate for the purpose of figuring the larvæ of various Japanese Lepidoptera. This drawing differs altogether from the coloration and markings of the larva of *minuticornis*, Guenée, as exhibited in the series of that species in the British Museum Collection, and as described and figured by Moore in his 'Lepidoptera of Ceylon.' Moreover, a critical comparison of the series of *minuticornis* in the British

Museum Collection, which includes Guenée's female type, with the series of this new *Calpe* in the British Museum Collection and my own collection, shows a variation sufficiently marked to warrant the latter being separated as a distinct species, apart from the fact that the larva differs entirely in colour and markings from that of *minuticornis*. I therefore propose the name *hokkaida* for this new species, and give below a description of the imago and larva, and also the description of the larva of *minuticornis* taken from Moore's 'Lepidoptera of Ceylon.' In the series of eighteen specimens of *minuticornis* in the British Museum Collection, which come from Formosa, Sikhim, India, Ceylon, Java (1 ♀ type Guenée) and Australia, there still remains one male specimen from Oiwake, Japan (*ex* collection H. Pryer), which agrees remarkably well with Guenée's female type of *minuticornis* from Java (Horsfield), so that there are apparently two quite distinct, but very closely allied, species in Japan—one *minuticornis*, Guenée, whose habitat is at Oiwake, in the island of Honshū, situated at perhaps about 3000 ft. altitude, and lying between 36° to 47° northern latitude; and the other *hokkaida*, Mihi, which, so far, has been found only at Chang-yang, Central China, and on the plains of Hokkaidō, between 41° and 42° northern latitude.

Minuticornis is placed by Hampson in his unpublished manuscript of the 'Catalogue of the Lepidoptera Phalænæ in the British Museum,' vol. xiv, in Section VI of the genus *Calpe*, to which *hokkaida* also apparently belongs :

Section VI.—Antennæ of male with uniseriate laminations :—

A. Antennæ of male with the shaft fringed with scales above towards base :—

- | | |
|--|-----------------------|
| (a) Fore wing with distinct white streak just below costa, rather diverging from it towards apex | <i>orthograpta</i> . |
| (b) Fore wing without distinct white streak below costa | <i>minuticornis</i> . |

Description.

Calpe hokkaida, sp. n.

♂. Head, thorax, and abdomen pale brown, the latter greytinged. Fore wings lustrous pale brown, with numerous whitish striæ and traversed by olive brown lines; subbasal line inwardly oblique, not extended to dorsum; antemedial line inwardly oblique; medial line oblique, sharply elbowed at end of cell; postmedial line coppery red, oblique from apex to dorsum a third from tornus; all the lines inwardly edged with olive brown, and there are some olive brown clouds between the postmedial line and the olive brown undulated subterminal line. Fringes brown, paler at base, terminal line

brown. Hind wings pale brown with darker medial line and outer border; terminal line brown, fringes whitish. Underside whitish brown with a broad purplish transverse shade beyond middle of fore wings and two undulated lines beyond the blackish discoidal mark on hind wings.

♀. Similar to the male but darker in colour, especially on the hind wings.

Expanse: ♂ 48 mm.; ♀ 53 mm.

Collection number 1163. Reference to British Museum, Noctuinæ, Drawer 207.

Local distribution.—Hokkaidō.

General distribution.—British Museum Collection, Central China, Chang-yang (Pratt), 1 ♂. Japan, Hokkaidō (Andrews), 2 ♀. Wileman Collection, Hokkaidō, Hakodate, 1 ♂ type bred from larva of August 7th, 1902, 1 ♂ bred August 6th, 1902, 1 ♂ bred, undated, 1 ♀ type (Andrews), undated, unlocalised.

Larva (described from artist's figure).—Length about 58 mm. Head pale yellow. (One side of head only described.) Four black spots. One large one on the side, and one small one just above; two on the central area, namely one in the centre and one above on vertex of head. The two side spots are no doubt reduplicated on the other side of the head. Colour black. The body intersected dorsally and laterally with a few slender, thread-like, silver, longitudinal lines, more conspicuous on the anterior segments. Legs, prolegs and claspers pale yellow.

Food-plant.—This has been identified for me from the figure painted by my Japanese artist in Hakodate as being *probably* *Corydalis pallida*, Persoon, var. *platycarpa*, Maxim, Japanese name *Kikeman*.

Figured July 8th, 1902, pupated July 15th, 1902, ♂ imago emerged August 7th, 1902.

Larva and pupa of Calpe minuticornis, Guenée.—“Larva olive-grey; with a subdorsal row of black-bordered yellow spots and clots, and a sublateral row of small yellow spots; a sublateral pale pinkish-bordered black line enclosing the spots from fifth segment; stigmata black; head ochreous yellow with a black cheek-spot; legs pale pink. Pupa dark purplish-red. Feeds on *Cocculus macrocarpus*, etc. (Thwaites).” Moore (*l. c.*).

Lane End,
Westcott,
Dorking.

NOTES ON BRITISH ORTHOPTERA IN 1921.

BY W. J. LUCAS, B.A., F.E.S.

Forficulodea.—Earwigs (*Forficula auricularia*, Linn.), that are found as imagines in the early months of the year, we are accustomed to look upon as having hibernated in that stage; but we are still somewhat uncertain when, in a state of nature, the earliest imagines of the new season begin to appear. In 1921 R. South found a female between 8 and 17 June at Padworth in Berks; but I first noticed one myself, a male, at Merton Park, Surrey, on 26 June. C. W. Bracken found the variety *forcipata*, Steph., common at Newquay in Cornwall in August; and I took one on the road between Esher and Oxshott, Surrey, on 29 Sept. The latter was interesting as having the pale spot distinct on the visible point of the wings.

Blattodea.—On 31 May in the New Forest I found in the damp layer at the bottom of a heap of cut heath or heather a fairly large nymph of *Ectobius lapponicus*, Linn.; this apparently had hibernated as a nymph. Again in the Forest on 12 September, under a collection of dead leaves and sticks by the side of Blackwater, I met with two or three small nymphs, which clearly were going to hibernate in that stage. Of *Ectobius perspicillaris*,* Herbst., an interesting record has come to hand. H. M. Hallett, while at Llangennith at the extreme end of Gower Peninsula in Glamorganshire during the second fortnight of July, found this cockroach in all stages of growth. One was carrying its ootheca; but this fell out while the insect was being mounted. The nymphs, which ranged from straw-colour to a reddish tinge, were most agile. They occurred in all their stages under *Erodium*, but were found most plentifully under cut Marram-grass. In that district they mow the grass for the purpose of thatching hay-ricks, and it was under recently mown material that the insects abounded. The imagines made no effort to fly when disturbed, but their rapidity of movement was quite sufficient to render catching them a work of more than ordinary difficulty. Mr. Hallett was kind enough to present me with two females and an ootheca. K. G. Blair found a male *Blatta orientalis*, Linn., in the Isle of Man from 1–12 July in a garden, but near a kitchen. In the refuse tip at Penarth, Glamorganshire, H. M. Hallett states that he frequently turns up *B. orientalis* in all stages under old sacks, sheets of old linoleum, etc.

* As suggested in my 'British Orthoptera,' p. 72, footnote, *E. perspicillaris* is almost certainly only a pale form of *E. lapponicus*.

Gryllodea.—*Nemobius sylvestris*, Fabr., did not make itself noticeable in the New Forest, but it was not necessarily less common than usual. Between 31 Aug. and 20 Sept. a few small nymphs were met with on one occasion; possibly the drought had caused the imagines to be over early, as I did not see any. E. A. C. Stowell on a visit to Selborne enquired for the "Short Lithe," where Gilbert White used to get the Field Cricket, *Gryllus campestris*, Linn.; but, if his identification was correct, found it now planted with beech. One interesting accompaniment of the long drought was a great recrudescence of the activities of the House Cricket, *Gryllus domesticus*, Linn. For some years I had not seen or heard this insect in the Kingston district, but during the summer and autumn it was remarkably evident in Kingston, Surbiton and New Malden at least. At night one was greeted with its chirpings out of doors in all directions, and this continued well into October, the sound becoming fainter at last, as if the insects were retiring indoors. Since they could not have arisen spontaneously, the race apparently must have been continuing somewhat obscurely, till the hot and dry weather caused a great increase in their numbers, and brought them out of doors and so into prominent notice. K. G. Blair makes a similar report for Hendon in June. H. M. Hallett tells me (*in litt.* 19 Aug., 1921) that the House Cricket swarms in the town refuse-tip at Penarth in Glamorganshire, but seems very much scarcer in houses than it used to be, though he had heard it recently both in Penarth and Cardiff, as well as in colliery villages in the county. On 5 December I heard one in the evening at the Royal Caledonian School, Bushey, Herts, and was told that the Crickets were common there and were found to be a nuisance. When attention was called to the chirp, one person present discovered that he could not hear it, the pitch presumably being too high. At the beginning of May the next year (1922) I received a female from the School, where they were then not numerous. It had a double postal journey before reaching me, but arrived apparently quite well. No doubt other observers could report an increase last summer in the number and activity of the House Cricket. K. G. Blair had brought to him a female of *Gryllus bimaculatus*, De Geer, from the London Docks in August. This of course is only a casual arrival.

Locustodea.—*Pholidoptera griseoaptera*, De Geer, was taken at Send in Surrey on 28 July (G. Fox-Wilson). One captured on 13 September in the New Forest, when eviscerated, contained only yellowish eggs, apparently not ready for laying (Lucas). H. M. Hallett reports that *Phasgonura viridissima*, Linn., is not uncommon in parts of Glamorganshire. He has several times come across it himself, and others have sent or shown it to him. Two males of *Leptophyes punctatissima*, Bosc, were taken at

Abersock in Carnarvonshire in September (T. V. Campbell). Besides the above new records, the outstanding event in connection with the Locustodea is the capture of a macropterous female of *Metrioptera brachyptera*, Linn. This was taken by G. Fox-Wilson at 9.30 a.m. on 3 August resting on a vine rod about $2\frac{1}{2}$ feet above the ground in the Early Vinery at the Royal Horticultural Society's Gardens at Wisley in Surrey. The side and top ventilators were half open, which means that a wide enough space was left to admit a bird as large as a plover. The insect was resting on the rod quite near the side ventilator at the north end of the house on the east side. The Vinery is composed of three houses—Early, Medium and Late—joined into one house, and is about the middle house of a group of 8 glass-houses. On the north end of the house a shrub-border runs, with herbaceous borders, etc., beyond it. On the south there is a lawn used for hay, with the vegetable garden behind it. Wisley Common is 200 yards away on the east side. Consequently it is quite reasonable to suppose that the insect was bred on the Common and flew in at the ventilator. It is at present a unique British example of this form of *M. brachyptera*, but not absolutely the only specimen known. The figure is multiplied by $1\frac{1}{2}$, and, though the hind-wing is somewhat folded, the venation appears to be as marked.



[W. J. L., photo.]

Metrioptera brachyptera, Linn. ($\times 1\frac{1}{2}$).
(Macropterous female.)

The hind wing is somewhat folded, but venation appears to be as indicated.

Sc = subcosta. R = radius. M = medius.

Cu = cubitus. IA = first anal.

Acridiodea.—G. T. Lyle captured at Wicken Fen, quite at the beginning of April, a very dark male imago of *Tetrix subulatus*, Linn., which he sent to me. Later he was able to send a female (captured there on 1 May) with somewhat pale pronotum, edged with paler yellowish-brown. On 6 June at one of the haunts of this insect in the New Forest I took only one male and two females, although it was a bright day. No doubt most of the hibernated examples had died after the next generation had been provided for. On 30 May I captured in the New Forest a large dark speckled female imago of its congener *Tetrix bipunctatus*, Linn. On 13 June in the New Forest the first imago of *Gompho-*

cerus maculatus, Linn., was secured—a female with pale mid-dorsal line to head and thorax, and pale dorsal part of closed wings. In August Bracken took this species at Newquay in Cornwall. *Mecostethus grossus*, Linn., was found mature in the New Forest on 21 July. Others were taken there in various localities afterwards. A nymph captured on 31 July produced a female imago on 6 August. Of *Omocestus rufipes*, Zett., the last noted was a male on 12 September in the New Forest, but no particular search was made for the species. *Omocestus viridulus*, Linn., was taken mature as early as 30 May, in the New Forest. On 1 July imagines were met with at Elstree Reservoir and at Stanmore Common in Middlesex. A fine female was taken at Hillend Hill, Pentlands, Midlothian, on 23 July (Evans). On 2 July the common grasshopper, *Stauroderus bicolor*, Charp., was found mature on high dry ground near Chessington in Surrey: there were numbers of nymphs, but few imagines. Later, on 27 August, at the same place, though there were darker specimens, most examples were light in colour, often with pale yellowish longitudinal stripes, thus assimilating very markedly with the scorched grass: occasionally they had a reddish or greenish tint in parts. Dr. B. P. Campbell sent me 19 males and 20 females which he took on 17 July at St. Cyrus near Montrose. The females varied as usual in colour, the males were much more uniform in tint. A male was captured at Abersock in Carnarvonshire on 1 Sept. (T. V. Campbell). One was taken on Esher Common in Surrey on 29 September, when, after the fires and drought, grasshoppers were few in number. On 3 July a male *Chorthippus parallelus*, Zett., was found mature near Chessington. The species was taken there again, green in colour, on 27 August.

On the whole the season for grasshoppers appeared to be an early one; but apparently it ended early also. From 31 Aug.—20 Sept. in the New Forest they were not particularly numerous, nor were their songs very often heard.

I must not conclude without referring to an addition to the known Orthopterous fauna of the Channel Islands. On 23 Oct. 1921 J. R. le B. Tomlin gave me a female earwig, *Forficula pubescens*, Gén , which he took in Guernsey in September. The females of some species of *Forficula* are rather alike, but, after detailed examination by K. G. Blair and myself, there was no doubt about its identity. Entomological visitors to Guernsey will perhaps secure other specimens, including males, of this earwig, which has not yet been found in Britain.

Kingston-on-Thames;

July, 1922.

A NEW MYMARID FROM NORTH WALES.

BY LIEUT.-COL. ALFRED W. RYLAND, F.R.M.S.

Neurotes flaviventris, sp. nov.

♂. *Head*, viewed from above, subdeplanate, almost twice as broad as long and slightly broader than thorax; in side view globose with a line of five or six stout hairs running from the vertex to frons; antennæ filiform, of ♂ thirteen-jointed and longer than insect; scape dilate, sinuate, elongate and twice as long as first flagellum joint; pedicellus broad and compressed, sub-equal in length to first flagellum joint; first joint of flagellum half the length of the scape, the four following joints equal in length and slightly longer than the first; the sixth to tenth equal in length and each slightly longer than the fifth; the apical joint slightly longer than the tenth joint. *Thorax* long, one fifth longer than abdomen; in side view elongate deplicate and apically truncate. *Abdomen* subsessile. *Legs* slender and elongate, and seated compact at base of thorax; all tarsi longer than their respective tibiæ or femora; all femora shorter than their respective tibiæ; tarsi five-jointed. *Wings* narrow and elongate with the costal margin convex and the lower margin straight; pilosity infumate; cilia long, the longest nearly double the width of the broadest part of the wing. Costal nervure strongly elongate, slightly more than half length of wing, and slightly enlarged at tip. Hind wings narrow, and more than two thirds as long as front wings, with long cilia.

Head and *thorax* infusate-fuliginous; scape, pedicel, entire *legs* and ventral side of *abdomen* flavous; flagellum somewhat darker than scape; dorsal area of abdomen nigrescent. *Abdomen* subsessile and, in side view, subcuneiform, as deep as long and attached to thorax at lower point of base. Tarsi of first legs longest, of hind legs shortest. Tibiæ of centre and hind legs of equal length; femora of front and centre legs of equal length. First and fifth joints of tarsi of front legs of equal length and nearly double that of their respective intermediate joints; all second, third and fourth tarsi joints of equal length except the third joints of the centre legs, which are slightly shorter.

Length, ♂ ♂, .65 mm., .74 mm.

At first sight this insect is much like *Polynema*, Hal., but the abdomen is subsessile, the thorax longer, and the legs all seated far back; and it differs from *Neurotes** *iridescent*, Enock, in the entire pilosity of the front wings, which are more narrow and elongate, with the apices more elongately ciliate.

♀. (Somewhat damaged.) Scape slightly shorter than that of ♂. Antennæ broken off above second flagellum joint; first joint one-third length of scape, second joint more than twice as long as first. Thorax somewhat stouter and not quite so apically truncate as in ♂.

* This genus was described by Enock in the 'Hastings and E. Sussex Nat.', vol. ii, 1915, p. 178. The present insect is best placed therein for the present, though the elongate alar cilia allies it more closely with *Litus*, Hal.—C.M.

Ventral side of abdomen extending below point of attachment with thorax, and ascending from base in a straight line to anus. Terebra not extending beyond anus. Legs not quite so long as in ♂; tarsi of the centre and hind legs the same length as their respective femora, and not longer; all second, third and fourth joints of equal length except the third joints of the centre and hind legs, which are slightly shorter. Wings shorter than those of ♂ and proportionally narrower.

Length, ♀ .62 mm.

Captured on long fine grass at the top of hill Bryn Euryn, Rhos, near Colwyn Bay, North Wales, ♂ on September 29th, and ♀ on October 1st, 1921, respectively.

Glen Hurst,
Fulwood,
Preston;
May 4th, 1922.

NEW CHALCID FLIES FROM AUSTRALIA.

By A. A. GIRAULT.

Types in Queensland Museum and from Queensland unless otherwise stated. Descriptions based upon comparisons, hence their brevity.

1. *Babinda dei*, sp. nov.—As genotype, but tibia 3 jet save apex and knee narrowly, antennæ jet save basal $\frac{1}{3}$ scape, also ventral margin femur 2 black. Postmarginal vein somewhat longer. Types compared.

1 ♀, forest, Wynnum, March 30th, 1922.

2. *Erythmelus tintoreti*, sp. nov.—As *cinctus*, but tibia 1 for the most part dusky, distal funicle no larger than others and a half wider than long; discal cilia of fore wing of two long lines from venation to apex, one cephalad, one mid-longitudinal; and fringes twice greatest wing width.

Very distinct species. Wynnum, on a shop window, April 2nd, 1922.

RAFFÆLLIA, gen. nov. Encyrtini.

As *Pseudaphycus*, but metallic, and 1 of jaw distinctly shorter than the acute 2 or 3, the jaw narrow. Habitus of *Coccidencyrus*. Scape moderately dilated.

3. *R. sidneyi*, sp. nov.—Dark æneus, wings clear, veins brown. Knees, tibial tips, tarsi white, funicle soiled white. Pedicel twice funicle 1, latter cup-shaped, a bit longer than wide, 2-3 equal, somewhat wider than long, 4-5 quadrate, twice 3 and distinctly larger than 1. Only 2-3 lines of cilia proximad hairless line and these incomplete, caudad abruptly finer and fainter. A line of minute

cilia along submarginal to base. Postmarginal a short stout cone. Frons moderate, scrobes deep. Stigmal vein straight, paler, its knob not differentiated. Club top-heavy, blunt at apex.

Sydney, New South Wales, forest, October 28th, 1917.

MESOCALOCERINUS, gen. nov. Ectromini.

As *Xenostryxis*, but ovipositor not extruded, and as *Cristatithorax*, but scutellum simple, form and antennæ slender. Frons moderately wide.

4. *M. gemmus*, **sp. nov.**—Purple, head, thorax cephalad of scutellum save cephalic margin of scutum on each side of meson and cephalic margin of axilla and neck of prothorax, honey; basal $\frac{1}{4}$ abdomen, legs save coxæ and the hind femora and tibiæ save ends of latter, scape, whitish. Fore wings smoky from base of marginal $\frac{5}{6}$ way to apex, the dense cilia coterminous with infuscation. Scape, flagellum cylindrical, funicles subequal, $\frac{3}{4}$ longer than wide, a bit shorter than pedicel. Postmarginal very short, stigmal short, nearly half of marginal. Basal $\frac{1}{2}$ femora and tibiæ 3 white.

Wynnum, forest, May 24th, 1921.

5. *Eurytomocharis omnirubricornis*, **sp. nov.**—Robust, abdomen sublanceolate, nonstylete. Black, umbilicately punctate, head and thorax with short golden pubescence. Legs save coxæ, apex ovipositor valves and antennæ save pedicel above rich red, venation and fore wing from base to apex of veins, yellow. Marginal somewhat exceeding postmarginal. Funicles longer than wide, 1–2 longest, equal, twice longer than wide, pedicel small. Propodeum with a gouged-out rather wide median channel with 2 foveæ at base, otherwise smooth and shining. Mesopleurum with oblique irregular rugæ. Prepectus scaly, with 3 foveæ in a longitudinal line, 3 largest, at cephalic edge. Abdomen 5 a bit higher than long, 2–4 moderately short, petiole very short. Ocelli in a curved line, lateral a bit further from eye than from cephalic.

Two females, Nelson and Kuranda (type), A. P. Dodd.

AUSTROENCYRTOIDEA, gen. nov. Encyrtini.

As *Zaomencyrtus* but postmarginal long, $\frac{1}{3}$ longer than stigmal, club not enlarged, frons wide, ovipositor inserted at base.

6. *A. leichhardtii*, **sp. nov.**—Æneus brown, wings with a small cloud against marginal and stigmal veins, latter dark brown; tarsi, knees widely, tibiæ 1, distal $\frac{1}{3}$ or more of other tibiæ, yellow, also apex ovipositor and the scape. Latter a bit exceeding club; pedicel much exceeding any funicle; funicles 1–2 equal, a bit longer than wide, 3–4 quadrate, 5–6 largest, subquadrate, each joint with a whorl of not long bristly setæ. Cheeks, vertex with short, very sparse setæ, jaws bare. About 5 lines of cilia proximad of the hairless line, these most crowded proximo-caudad and prolonged toward base in a widely-spaced single line; a closer line along submarginal to base.

Costal cell entirely ciliated. Club $\frac{3}{4}$ funicle. Scutum with white, loose lying-down pubescence.

A female south-east Queensland.

7. *Trichogramma mirum*, **sp. nov.**—*Trichogramma australicum* in Girault, 'Memoirs Queensland Museum,' vol. iii, 1915, p. 153.

Specific character the minute bladder-like appendages on antennæ. From eggs of *Chilo*, Java. Form ought to be named until its characteristic is known to be trifling, foreign or accidental.

AUSTRALOMPHALE, **gen. nov.** Omphalini.

As *Closteromphale*, but stigmal nearly perpendicular to marginal, a bit shorter than postmarginal, a short slender neck, a moderately large knob studded with short setæ; abdomen distinctly compressed, ovipositor extruded $\frac{1}{3}$ abdomen's length, above it a compressed stylus over $\frac{2}{3}$ its length. Prothorax conical. Scape coarsely serrate on one edge. Jaw 3 truncate. Setæ from venation gross.

8. *A. auriceps*, **sp. nov.**—*Genotype*. Blue, wings clear, a deep cross-stripe from stigmal knob; head, legs save coxæ, the femur 3, the tibia 3 at basal $\frac{1}{2}$, golden. A wide coppery median stripe on dorsal thorax (save propodeum). Funicle $1\frac{1}{2}$ longer than wide or than pedicel, 4 quadrate. Club with no terminal armature.

Nelson, A. P. Dodd, August.

9. *Australomphale varicornis*, **sp. nov.**—Same, but dorsal thorax of one colour; head concolorous, wings clear, scape save slightly at apex, nearly proximal $\frac{1}{2}$ of funicles 2-4 white (club not seen). Coxæ, femur 3, femur 1 or 2 beneath and above more or less, tibiæ 1 or 2 at apex, above and below on each side of middle and near base above, dusky; tibia 3 save apex, white. Stigmal knob and base of marginal jet, with a cluster of short jet hairs (that base marginal absent in genotype). Funicle 1 nearly 3 times longer than wide.

Nelson, November, 1920, A. P. Dodd.

AUSTRALÖODERA, **gen. nov.** Eupelmini.

As *Eupelmus*, but scutellum with a tuft of bristles near apex, a smaller, looser one at base of the thickening of submarginal. Ovipositor equal abdomen.

10. *A. varicornis*, **sp. nov.**—Orange, purple as follows: Scape above at distal $\frac{1}{2}$ and a spot at basal $\frac{1}{4}$, beneath to middle from basal $\frac{1}{4}$; pedicel, funicles 1-2, 7-8, 3 above widely; cheeks centrally; abdomen except beneath at base rather widely, scutum at distal $\frac{1}{3}$ between the ridges, base coxa 3, propodeum, 2 cincti on tibia, 2 on basal $\frac{1}{2}$; ovipositor valves save basal $\frac{1}{2}$ of distal $\frac{1}{3}$. Silvery as follows: Scape, funicles 3-4 save as noted, funicles 5-6, space between cincti of tibia 2, coxa 3. Fore wings embrowned from the tuft to apex, 4 eye-spots, 1-2 opposed to each other and at margins. Postmarginal $\frac{1}{3}$ longer than the short stigmal. Scape clavate; pedicel elongate, equal funicle 3 which is longest, 3 larger than wide, 1

quadrate. Discal cilia except caudad in a few longer lines terminating at the tuft.

Four females, Kuranda and Nelson (*type*), A. P. Dodd.

11. *Aphelinus damoni*, **sp. nov.**—Orange, legs paler, wings clear, veins yellow; scutum, scutellum each with a rather wide dusky stripe on each side of median line save narrowly at each end; abdomen with 4 complete dusky stripes, a shorter one at apex; a dusky dot on axilla. Median groove scutum, scutellum distinct. Hairless line widely closed cephalad, also by one line at caudal margin, $6\frac{1}{2}$ lines of somewhat coarser cilia proximad of it, thence naked save 3 short lines from band of submarginal. Marginal distinctly shorter than submarginal, a short postmarginal ending in a bristle like those of marginal. Scutum about 20 longish setæ, scutellum 6. Stigmal oblique. Hind wings 15 lines of discal cilia, the first two paired more or less save distad. Submarginal 5, marginal 4 gross bristles. Hairless line if continued would meet costa distad of venation.

An odd species. Wynnum, forest, and a second female later on March 1st, 1922. In my table follows *ruskini*.

12. *Habrolepoidea raffaellini*, **sp. nov.** Legs entirely concolorous save knees, tibial tips, tarsi. Funicles twice larger than wide, equal each other and pedicel. Jaws rather narrow, somewhat as *Schedius*, 1-2 equal, subacute, 3 a half shorter. Postmarginal and stigmal equal, marginal a bit shorter, nearly twice longer than wide. Frons moderate.

Æneus, wings clear, a small cloud at marginal; club $\frac{1}{2}$ funicle. Costal cell wholly ciliated, submarginal setæ gross; 4-5 lines of cilia proximad hairless line, these uniting before hind margin and running to base (at least half way there).

Somewhat like *Echthrobacca angeliconini*. 3 ♀s, forest, Sydney, New South Wales, October 28th, 1917.

MESANUSIA, **gen. nov.** Ectromini.

As *Baoanusia* but club pointed-ovate, 3 deeply sunken, the region equal funicle; marginal $2\frac{1}{2}$ times longer than wide, a bit exceeding stigmal. Ovipositor concealed. Frons narrow, dilation of scape moderately great.

13. *M. latiscapus*, **sp. nov.**—Brown æneus, fore wing lightly dusky from about hairless line to apex; proximad of former cilia extending to base, the line closed near hind margin by two lines of cilia. Submarginal setæ moderate, costal cell absent or nearly. Funicle 1 longest, half wider than long, 2 twice wider than long, rest gradually widening but not lengthening, all shorter than the moderate pedicel. Scape widest distad, somewhat over twice longer than wide. Hind wings translucent, with short caudal fringes, apparently naked otherwise, its submarginal long, convex.

Pentland, forest, November, 1917.

Wynnum, Queensland,
Australia.

NOTES AND OBSERVATIONS.

CORRECTION OF NOMENCLATURE OF MICROLEPIDOPTERA.—**Phalonia grisescens**, nn. (= § *griseana*, Hw.). This brief note is published for the immediate correction of the name of a species now under special study. The much-discussed *Conchylis* "*griseana*, Hw." must still be criticised from another point of view. *Tortrix griseana*, Hw., 'Lp. Br.', 402 sp., 25 (1811), is absolutely homonymous with *Tortrix griseana*, Hb., 'Smlg. Eur. Schm.', 7. Pf. 21. 135 (1797). Haworth's species is therefore nameless, and **grisescens**, nn., is suggested to replace it.—JNO. HARTLEY DURRANT and J. DE JOANNIS; British Museum (N.H.), August 19th, 1922.

VANESSA C-ALBUM IN NEW FOREST.—At Brockenhurst, on Tuesday, August 15th, I took a specimen of *c-album* off a lime tree nearly opposite the New Forest Lawn Tennis Club. I believe that this species is extremely uncommon in the forest. *Colias croceus* was plentiful, though I did not come across var. *helice*.—L. H. BOND; The Cottage, Welby Gardens, Grantham.

COLOUR-PRESERVATION IN DRAGONFLIES.—L. E. CAMPBELL-TAYLOR writes: "I suppose you do not know if there is a method by which the colours of the Odonata can *satisfactorily* be preserved. I have tried for many years in a great number of ways and cannot yet find a satisfactory method. Lucas states in his book that Nunney says the colours of *Aeschna cyanea* treated with an injection of boroglyceride were *as bright after two years* as when the insect was alive. I feel bound to question the accuracy of this—at any rate boroglyceride will not do this for me; in fact it does not preserve the colours *two months*, let alone two years."

[Nunney's method of preserving the colours of Odonata was quoted for what it was worth. I have not tried it myself, nor have I heard of anyone else doing so, previous to Campbell-Taylor's attempt. Personally I should not care to put insects so treated into the cabinet. If dragonflies are placed in spirit *before any decomposition has taken place* their colours will usually be preserved almost or quite unchanged, and will be available for examination. Many species of course do not lose their colours in drying, especially after evisceration, and *occasional* specimens of other species retain them perfectly. If the conditions under which these latter keep their colours were known we should be on the way to our desired result. Unfortunately we cannot tell beforehand which specimens are going to retain their colouring, or we might discover the determining cause. Keeping dragonflies alive for a time without food seems to be an undoubted aid to colour-preservation. *Aeschna cyanea* is one species that frequently retains its colours unchanged, hence perhaps Nunney's success with that species in connection with the boroglyceride method. If, after specimens had been dried in spirit, we could relax the legs and wings without interfering with the abdomen, we might perhaps achieve some measure of success from the cabinet point of view at any rate; but for scientific purposes a naturalist would prefer to have his specimens

"doctored" as little as possible.—W. J. LUCAS; Kingston-on-Thames.]

C. CROCEUS IN SOMERSET IN MAY, JULY AND AUGUST.—*C. croceus* first appeared at Bruton this year on May 25th, when I took a ♀ of 68 mm. expanse (the largest specimen I have yet taken, although I have examined several thousand in Egypt, etc.). On May 26th I saw ab. *helice* and *C. croceus* was fairly common for a fortnight, but I have only records of females. I also took it during this same period on the Turf Moor at Ashcott and in Dorset at Shillingstone (both females). On July 27th fresh males began to emerge at Bruton, and are now not uncommon. I took my first ♀ on Aug. 7th—an ab. *helice* (also ab. *obsoleta*, Tutt).—K. J. HAYWARD, F.E.S.; Bruton, Somerset, August 8th, 1922.

COLIAS CROCEUS (EDUSA) IN AUGUST AT BRIGHTON.—I captured a fine female specimen of *Colias croceus* on the Downs here on August 15th last.—J. R. SLEATH; 112, Ditchling Road, Brighton.

COLIAS CROCEUS IN SURREY AND NORTH CORNWALL.—Whilst staying in North Cornwall in May I noted about half-a-dozen specimens of *C. croceus* in the neighbourhood of Padstow, and on the railway bank between Padstow and Okehampton. To-day when taking a few *Augiades comma* on the downs at Coulsdon, I saw, but did not capture, a male *C. croceus*, which appeared to be in fresh condition. This was during one short burst of sunshine on an otherwise almost sunless but bright morning.—ARTHUR BLISS; The Cottage, Red Down Road, Coulsdon, Surrey, August 13th, 1922.

COLIAS CROCEUS, ETC., IN SUSSEX.—On July 25th I saw a *Colias croceus* (edusa) on Sussex Downs, near here, and on August 10th I saw a specimen of the same species about twenty yards from the same spot. This one I was able to bag, and found it to be quite fresh and in perfect condition. I have seen no specimen since, but expect by the time this is published *C. croceus* will be plentiful in many places. On May 29th this year I netted a specimen of *Eulype hastata* whilst beating herbage in this locality. It is very like specimens taken at Rannoch, except that the black dots between the bands on fore and hind wings and the dark triangle at base of the latter are absent. On May 23rd I netted a fine specimen of *Lobophora viretata* near its food-plant. This specimen was mostly green in colour. On August 11th I took a second brood one at rest on a fir tree; it was quite fresh but without a trace of green on it; it was yellow with black markings.—(Major) J. J. JACOBS; Holmesleigh, Burgess Hill, Sussex, August 15th, 1922.

THECLA W-ALBUM IN STAFFS, ETC.—On July 31st, at Denstone, Staffs, I had a rather worn ♀ of *T. w-album* brought to me which had been found with another specimen near Denstone. The other specimen was not taken, however. This seems curious, since the last North Staffs F.C. record is one seen in 1902 at Market Drayton by Messrs. E. D. Bostock and F. C. Woodforde. It apparently also used to occur near Burton. On August 10th, near Godalming, I saw a specimen of *C. croceus*.—GUY STANTON; The Glebe Farm, Shackleford, Godalming, August 13th, 1922.

COLIAS CROCEUS, FOURC. (EDUSA, FAB.).—As several inquiries have been received with regard to the use of the name *croceus* for the species usually and very generally known as *edusa*, it may be stated that it is purely a question of priority. Fourcroy gave the name *croceus* to the species in the year 1785; Fabricius did not publish his *edusa* till 1787. That *croceus* is the right name was pointed out by Kirby in 1871, but very few writers have adopted it. It is used here because it is the right name, in the hope that it may be generally adopted, to the benefit of future entomologists.—N. D. R.

A RECORD CAPTURE OF BLUES.—Mr. C. G. Clutterbuck and myself saw in an area of about 200 yards, in the Bainswick district, Glos., the following Blues: *Aricia medon* (*astrarche*), *Polyommatus icarus*, *Agriades bellargus*, *Cupido minimus* and *Lycaena arion*—surely a record. The date was June 10th, 1922.—G. H. SIMPSON HAYWARD; Icomb Place, Stow-on-the-Wold.

PHRYXUS LIVORNICA LARVA IN SOMERSET.—A larva of *Phryxus livornica* was brought to me a few weeks ago, found by a small boy in a field near, on dock. The imago has emerged to-day.—A. R. HAYWARD; Misterton, Somerset, August 3rd, 1922.

PACHYS BETULARIA DOUBLEDAYARIA AT SOUTH NORWOOD.—A male specimen of *doubledayaria* was found at rest on the pavement in Grange Road, S. Norwood, in the forenoon of July 23rd last. It seemed to be in good condition when I picked it up. As I had no box to put it in it allowed itself to be carried for about a mile clinging to a finger of my hand.—RICHARD SOUTH; 4, Mapesbury Court.

NOTES ON LEPIDOPTERA FROM THE NEW FOREST AND SWANAGE, 1922.—A week in the New Forest this year, from July 1st to the 8th, proved rather disappointing, mainly owing to the inclement weather. Many species of butterfly appear to have been late this summer. *Limenitis sibylla* was plentiful and in much better condition than is generally the case by July. *Argynnis paphia*, males, just emerged, were about in good numbers, but only one female was seen during the week. *Argynnis aglaia* and *A. cydippe* were fully out and fairly common near Brockenhurst. *Brenthis selene* showed evidence of late emergence, as it was still in quite good order. Nothing was seen of *Satyrus semele*, *Aphantopus hyperanthus*, *Epinephele tithonus* and *Adopaea thauwas*. Males of *Diacrisia sanio* frequently turned up on the heather, and *Euchloris pustulata* was not uncommon at dusk. Sugar proved attractive on several nights at Hurst Hill, but only common species visited it. *Boarmia roboraria*, *B. repandata*, *Noctua brunnea*, *Xylophasia monoglypha*, *Aplecta nebulosa*, *Euplexia lucipara* and *Triphaena pronuba* were most in evidence, the latter a perfect pest. The following week was spent at Swanage, and the weather improved somewhat. *Melanargia galatea* and *A. aglaia* were both abundant. *Lycaena aegon* swarmed on the moors north of Studland and also occurred in lesser numbers on the downs, far removed from heather. *Zizera minima* and

Lycaena bellargus, first brood, were still about in considerable numbers, but only one or two *Satyrus semele* were seen. *Adopaea actaeon* was late, not appearing until July 11th, and not more than a dozen were seen up to the 15th, when I left. *Macroglossa stellatarum* was not uncommon in the vicinity of the town. Sugar was attractive on the undercliffs, but produced no typical coast species.—S. B. HODGSON; 3, Bassett Road, N. Kensington.

LEPIDOPTERA IN THE BRADFIELD (READING) DISTRICT, 1922.—A list of the species of butterflies met with near Bradfield College in the marshes and woods during the week ending August 1st may be of interest. The weather was showery with very hot intervals, generally of about an hour's duration. Yet in the marshes west of the College buildings *Pieris rapae* and *P. napi* were in great abundance, also *Polyommatus icarus*, *Heodes phlaeas*, *Aphantopus (hyperanthus)* and *Epinephile jurtina*. *Vanessa io* and *Aglais urticae* were plentiful, and I saw one specimen of *Limenitis sibylla*, in very bad condition. At the Reservoir, a large open space in the woods planted with shrubs and saplings, *Zephyrus quercus* and *Callophrys rubi* were to be seen flying quickly over the trees. *L. sibylla* and *Dryas paphia* were plentiful, though extremely fast on the wing. *P. rapae* and *P. napi* abounded. I saw one specimen only of *Adopaea flava*, which used to be plentiful; whilst, of the other Skippers which used to abound here before the ground was ploughed for planting saplings, I detected none. I saw and caught one specimen each of *Melanargia galatea*, *Aricia medon* and *Satyrus semele*. The latter, however, escaped. *A. hyperanthus* and *Epinephile tithonus* were swarming over wild rose-bushes. *Coenonympha pamphilus* was everywhere. *Thecla w-album* could be seen flying high over a certain hedge not far distant. During the past term one larva of *Polygonia c-album* was found on nettle and pupated in due course, imago hatching about July 29th; many larvæ of *Dicranura vinula* were collected, and one specimen of *Amorpha populi*.—C. J. V. GRAY; 17, St. John's Park, Blackheath, S.E. 3.

DANAIS CHRYSIPPUS, L., AB. CANDIDATA, HAYWARD.—Since my notes on *Danais chrysippus*, L. (*antea*, p. 178), were written, I have succeeded in breeding (under natural conditions) a further specimen of ab. *candidata*—a male specimen identical with the type. I also saw but failed to take a similar insect (sex not determined) on the wing. Both at Reservoir, near Aswan, Egypt.—KENNETH HAYWARD; Vicarage, Bruton, Somerset.

A VARIETY OF CUPIDO MINIMUS.—On June 7th I found *C. minimus* very common in several places along the Downs, near Lewes, and on examining those settling at sun-down on grass stems I found amongst them a male with the submarginal spots produced to form fine rays or streaks on the undersides on all four wings.—E. CRISP; Heathcote, Heathfield, Sussex.

BUTTERFLIES ATTRACTED BY HUMAN PERSPIRATION.—Mr. Mathew's note in the May number of the 'Entomologist' has reminded me of similar occurrences, although the butterflies in these cases were far less abundant, both in numbers and species. In the

Mhondo forest, a favourite collecting-ground, which lies close to the lake, at a distance of about three miles south of Bukoba, butterflies—Lycænids and Acraea—would frequently alight on my bare arms to imbibe moisture, while I was resting in the shade beside a stream which flows through to the lake. Several of these were captured, but I regret I am unable to identify them at present.—N. C. E. MILLER; Mwanza, Lake Victoria Nyanza, E. Africa, July 9th, 1922.

HYBRIDISATION IN NATURE.—*Re* the note in the August number of the 'Entomologist' on hybridisation in nature, on June 24th, while sugaring in some woods a few miles from here, I took an *X. monoglypha* (male) and *A. nebulosa* (female) *in cop.* Unfortunately both died while still paired, so that no ova were obtained.—ALFRED H. SPLOING; 65, Manners Road, Southsea, Portsmouth, August 8th, 1922.

RECENT LITERATURE.

Natureland: A Quarterly Journal of Natural History. Edited by GRAHAM RENSHAW. Manchester: Sherratt and Hughes.

NUMBER 3, Vol. I, of this comparatively new periodical contains some excellent photographic reproductions, including one of *Euvanesa antiopa*, but is devoted mainly to Vertebrates and contains little of direct entomological interest. It is, however, well got up, and touches on many matters of more general interest, as suggested by its title.

The London Naturalist (Journal of the London Natural History Society) for 1921. Pp. xx + 80, with 1 plate. London: Published by the Society.

To those interested in structural abnormalities in Lepidoptera this volume should prove of immense assistance, as the greater part of it is occupied by an exhaustive paper on that subject by Dr. E. A. Cockayne, who has most successfully attempted to collect and group all the scattered references in entomological literature to this subject, supplementing this information throughout with a number of new observations of his own.

Records and Observations of British Lepidoptera during 1921. By S. GORDON SMITH and E. NEVILL WILMER. Pp. 71, 2 plates. Chester: G. R. Griffith, Ltd., 1922.

THIS small publication, consisting of a complete list of the 356 different species obtained by the authors in one season's collecting, chiefly around Chester, N. Wales and the New Forest, is mainly of interest on account of the methods employed. By means of a self-contained motor-caravan, fitted with a powerful electric light, some interesting data as to times of flight and the suitability of atmospheric conditions were obtained. A temperature below 50° Fahrenheit proved fatal to good results, but the barometer readings afforded little clue.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 3rd, 1922.*—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.—The President announced the death of Mr. A. W. Bacot, of York Cottage, York Hill, Loughton, Essex, and of Mr. Gilbert Storey, of the Department of Agriculture, Cairo, Egypt, and a vote of condolence was passed to their relatives.—The following were elected Fellows of the Society: Mr. C. L. Collenette, c/o Messrs. Barker & Co., Singapore; and Mr. Michael G. L. Perkins, 4, Dean's Yard, Westminster Abbey, S.W. 1, and Trinity College, Cambridge.—The Treasurer called attention to additions to the collection of portraits in the meeting room, and especially to a beautiful pencil drawing from a photograph of the late Dr. Longstaff.—Mr. W. G. Sheldon exhibited a series of *Pararge roxelana* from Herculesbad, and *P. climene* from Sarepta.—Prof. E. B. Poulton, F.R.S., illustrated some of his remarks with lantern-slides, and read some notes on the life-history of *Catochrysops phasma*, and on the life-history of a Bethyloid of the genus *Cephalonomia*, Westw., observed at Oxford by Mr. A. H. Hamm; he also read some interesting notes on the habits of the Driver-ant *Dorylus nigricans*, Illig., in Tanganyika Territory.—Mr. C. L. Withycombe exhibited larvæ of an adult of *Osmylus chrysops* with some enlarged figures of them, and also some larvæ of the mosquito *Taeniorhyncus richiardi* taken in Epping Forest.—The following papers were read: "The Mallophaga of the Oxford University Expedition to Spitzbergen," by Dr. J. Waterston, B.D., D.Sc.; "The Dasytinæ of South Africa," by Mr. G. C. Champion, F.Z.S., A.L.S.; "A Monograph of the Genus *Catochrysops*," by Mr. G. T. Bethune-Baker, F.L.S.; and "The Species of the Genus *Larinopoda*," by Dr. H. Eltringham, M.A., D.Sc., F.Z.S.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 25th.*—Mr. E. J. Bunnett, F.E.S., President, in the Chair.—Mr. Step exhibited the beetles *Necrophorus vespillo* and *Silpha thoracica* from a dead toad at Ockham, and Mr. Withycombe, the asparagus beetle *Crioceris asparagi*, now common at Enfield.—Mr. R. Adkin read a paper, "The Lepidopterous Enemies of Man."

June 8th.—Mr. E. J. Bunnett, F.E.S., President, in the Chair.—Mr. Step exhibited a *Vespa germanica*, ♀, which had hibernated in a chimney and was so misleadingly black as to suggest a new species!—Mr. Enefer an *Acrionicta alni*, of which he had found three larvæ at Penzance in August, 1921.—Mr. Withycombe, a Neuropteran, the rare *Chrysopa dorsalis*, bred from a pine-feeding larva at Oxshott in 1921.—Mr. Preston, butterflies from Macedonia, and Mr. Bunnett, ova, larvæ and imagines of *Melasoma populi* (Col.), from Oxshott, where it was found very commonly.—Mr. Step said that the *Cleora lichenaria* larvæ he had shown at a previous meeting had extended their feeding two or three weeks beyond the normal time and were found to be ichneumonated, except one which had developed to an imago in the normal period.—Mr. Coulson reported the capture of

Phryxus livornica at Merton, Surrey, on May 15th.—Various reports were made of the occurrence of *Colias croceus* (*edusa*) on the N. Downs, etc.

June 22nd.—Mr. E. J. Bunnett, F.E.S., President, in the Chair.—Mr. Staniland exhibited *Pterognathus gigas* and *Archon centaurus* (Col.) from the Gold Coast.—Mr. Withycombe, the Neuroptera (1) *Osmylus chrysops* alive with its larva, (2) *Sialis lutaria* and a living larva, (3) *Ithone fusca* from Australia and a preserved larva, (4) *Psychopsis leonina* from Africa and a preserved larva from Australia, and (5) *Stenosmylus excisus* from New Zealand, and gave notes on their life-histories.—Mr. Buckhurst, *Hesperia malvae* ab. *taras* from Effingham.—Mr. Goodman, aberrations of *Parnassius apollo* much approaching *P. delius*, from St. Martin Vesubie, *P. delius* with sparser markings than usual, and a *Parnassius* with characters intermediate between *delius* and *apollo* suggestive of a natural hybrid.—Mr. Syms, a larva of *Ruralis betulae* and a larva of *Anthophagus vacca* (Col.) in its cell for pupation.—H. J. TURNER, *Hon. Sec.*

OBITUARY.

H. H. C. J. DRUCE.

SON of Herbert Druce, whose writings were concerned chiefly with Heterocera, Hamilton Druce, stimulated no doubt by his father's collections, early evinced a keen interest in Lepidoptera, which developed into a specialisation on the Lycænidae and Hesperidae. His papers, of which the earliest was published in February, 1887, in the 'Ent. Mo. Mag.' (vol. xxiii, p. 203), at the age of nineteen, were numerous, but confined almost entirely to his favourite families. Included in them are: "A Monograph of the Genus *Hypochrysops*" ('Trans. Ent. Soc.,' 1891); "A Revision of the Genus *Iolais*" ('Ann. Mag. Nat. Hist.' (6) vol. viii, 1891); "The Lycænidae of the Solomon Isles" ('Proc. Zool. Soc.,' 1891); "Lycænidae of the S. Pacific Isles" ('Proc. Zool. Soc.,' 1892); "A Monograph of the Genus *Thysonotis*" ('Proc. Zool. Soc.,' 1893, in collaboration with Bethune Baker); "A Monograph of Bornean Lycænidae" ('Proc. Zool. Soc.,' 1895), with additions in the same publication in 1896; and a long and valuable paper on "Neotropical Lycænidae" in 'Proc. Zool. Soc.,' 1907. A large number of shorter papers appeared from him, mainly in the 'Annals,' the 'Ent. Mo. Mag.,' the 'Proc. Zool. Soc.,' and the 'Trans. Ent. Soc.,' the last being in the 'Annals' for March, 1913. His only separately published work was a small but very valuable volume containing photographic reproductions of many of the type-specimens of Lycænidae in the Berlin Museum, but he was, until forced to give up on account of ill-health, actively engaged in completing the volumes on Rhopalocera in the Fauna of British India Series. His collections are now in the Hill Museum, Witley, having been purchased by Mr. J. J. Joicey some three or four years ago.

Seriously ill for some years past now, and unable to follow actively his favourite study, he recovered sufficiently latterly to be able to visit again some of his old haunts, but not for long, as he died rather suddenly, we regret to hear, on June 21st last, at the age of 54. And so yet another is added to our already too long list of losses.

N. D. R.

F. B. NEWNHAM, M.A.

YET another of our older Entomologists has been claimed by the angel of death in the person of F. B. Newnham, who passed away very suddenly on June 2nd last, and was laid to rest in the cemetery here surrounded by the woods that he had worked and loved so much.

Born 72 years ago at Kerry, Montgomeryshire, his younger days were spent in France and India. After taking his M.A. at Oxford he studied for the Bar, and when about to be called was struck with a nervous breakdown, and sent to Church Stretton over 40 years back. Its bracing climate soon had the desired effect, and he was so taken with the place and its insect fauna that he abandoned the law, giving himself up to Entomology and never leaving, except for a four months' stay in Switzerland and one delightful three weeks with me at Fontainebleau. He had travelled throughout most of the Palæarctic Region, and amassed a remarkably fine collection of Lepidoptera.

After settling here he never missed a fine day in the field, and was exceedingly lucky in finding variations, in which his collection abounds. His chief prize was a very wonderful ab. of *Aglaia* with pale fawn ground and all the black markings on the upper side replaced by silver. In our numberless outings together he was always the lucky one, excepting when a gynandrous *icarus* fell to my net. We were together in discovering the occurrence of *L. corydon* here in 1916, and never previously noted in Shropshire.

Like his friend, the late Dr. Chapman, with whom he often corresponded, Newnham was a very strong upholder of the law of priority in nomenclature, and was equally averse to the needless multiplication of genera, arguing that it is more scientific to include and retain as many species as possible under one head. He was fond of quoting "*Eumicia*" *phlaeas* as a flagrant example of senseless change.

He was responsible for the Lepidoptera Section of the 'Victorian History of Shropshire,' and in 1894 separated, under the name of *hesperidis*, a dwarf race of *A. cardamines* regularly occurring here.

A devoted student of Nature, full of humour, he had a ready joke and kindly word for everyone, and was always pleased to show his treasures to the numerous entomologists visiting this district. He remained a bachelor, wedded to his hobby and the classics, reading usually until two in the morning and up again at seven for a long day in the field. Thus, his happy earthly life was passed. He has now crossed to those happier hunting-grounds that he loved to talk of, leaving those who knew him to mourn the loss of a true friend.

M. J. H.

Church Stretton;
August 21st, 1922.

EXCHANGE

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—*Papilio blumei* (unset), *Ornith*, *Miranda* ♂ ♀, etc. British larvæ (set); lists exchanged. *Coleoptera*, *Cetonia aurata* and vars. *purpurata*, *pisana* and others. *Potosia cuprea*, inserted and ora. *Heterocera*, S. Russia, in papers, data. *Desiderata.*—Exotic butterflies, larvæ, set (British) and unset *Heterocera*.—*W. Dannatt*, "St. Lawrence," *Guibal Road, S.E. 12.*

Duplicates.—Fine, well-set *Blandina*. *Wanted.*—Ova: *T. betulæ*, *solidaginis*, *paleacea*, *pistacina*. Larvæ: *B. rubi*.—*Frank Littlewood, Mount Pleasant, Arnside, West. (till September 23rd); after—10, Aynam Road, Kendal.*

Wanted.—*Cardui* and *Atalanta*: ova, larvæ or living fertile females. *Good return given, especially for Cardui.* in: Moderate abs. of *V. urticæ* and *Io*; *Conspicillaris*, *Rubiginea*, *Brevilinea*, *Pyrulina*, *Craccæ*, *Lychnitis*, *Chamomillæ*, *Venosa*, *Croceago*, *Oo*, *Irregularis*, *Conspersa*, *Xerampelina* and ab. *unicolor*; *Paleacea*, *Nigrocincta*, *Cassiope*, fair *Arion*, black *Lariciata*, *Dysodea*, *Pimpinellata*, *Sulphuralis*, *Affinis*, *Orichalcea*, etc.—*G. B. Oliver, 11, Oxford Street, High Wycombe.*

FOR SALE.—Whole or singly. Small collection of Nigerian Butterflies, Beetles and Insects, including Leaf Mantis (*Phyllocetania insignis*, W.A.) and *Titanodamon johnstonii*, large specimen. No dealers.

H. L. SWEET, 73, Thurlestone Road, West Norwood, London, S.E. 27.

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, October 4th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, *Hibernia Chambers, London Bridge, S.E. 1.*—*Thursday, September 14th, at 7 p.m.*, Exhibition of Orders other than *Lepidoptera*. *Thursday, September 28th, at 7 p.m.*, Ordinary Meeting. The fiftieth anniversary of the foundation of the Society will be celebrated by a Pocket-box Exhibition and Supper at the Holborn Restaurant on *Thursday, October 19th.*—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

CONTENTS.

- On the Identity of *Symphorobius (Hemerobius) elegans*, Stephens (Neuroptera), *C. L. Withycombe*, B.Sc., F.E.S., 193. On the Earlier Stages of *Cacoecia crataegana*, Hübner, *W. G. Sheldon*, F.Z.S., F.E.S., 194. A New *Callimorpha* from North-West Persia and Armenia, *W. H. T. Tams*, 196. On a New Species of Genus *Calpe* from Japan, *A. E. Wileman*, 197. Notes on British Orthoptera in 1921, *W. J. Lucas*, B.A., F.E.S., 200. A New Mymarid from North Wales, *Lieut.-Col. Alfred W. Ryland*, F.R.M.S., 204. New Chalcid Flies from Australia, *A. A. Girault*, 205.
- NOTES AND OBSERVATIONS.—Correction of Nomenclature of Microlepidoptera, *Jno. Hartley Durrant* and *J. de Joannis*, 209. *Vanessa c-album* in New Forest, *L. H. Bond*, 209. Colour-Preservation in Dragonflies, *L. E. Campbell-Taylor*, 209. *C. croceus* in Somerset in May, July and August, *K. J. Hayward*, F.E.S., 210. *Colias croceus* (edusa) in August at Brighton, *J. R. Sleath*, 210. *Colias croceus* in Surrey and North Cornwall, *Arthur Bliss*, 210. *Colias croceus*, etc., in Sussex, *J. J. Jacobs*, 210. *Thecla w-album* in Staffs, etc., *Guy Stanton*, 210. *Colias croceus*, Fourc. (edusa, Fab.), *N. D. R.*, 211. A Record Capture of Blues, *G. H. Simpson Hayward*, 211. *Phryxus livornica* Larva in Somerset, *A. R. Hayward*, 211. *Pachys betularia doubledayaria* at South Norwood, *Richard South*, 211. Notes on Lepidoptera from the New Forest and Swanage, 1922, *S. B. Hodgson*, 211. Lepidoptera in the Bradfield (Reading) District, *C. J. V. Gray*, 212. *Danaïs chrysippus*, L., ab. *andidata*, Hayward, *Kenneth Hayward*, 212. A Variety of *Cupido minimus*, *E. Crisp*, 212. Butterflies attracted by Human Perspiration, *N. C. E. Miller*, 213. Hybridisation in Nature, *Alfred H. Spling*, 213.
- RECENT LITERATURE.—Natureland: A Quarterly Journal of Natural History, 218. The London Naturalist (Journal of the London Natural History Society) for 1921, 213. Records and Observations of British Lepidoptera during 1921, 213.
- SOCIETIES.—The Entomological Society of London, 214. The South London Entomological and Natural History Society, 214.
- OBITUARY, 215.

Thymoplas

MOUNTING OUTFITS.



A simple & permanent method
:: for mounting insects, etc. ::

Adopted by the Entomological Department,
— Royal College of Science, London. —

Price 3/- (postage 6d.), and 6/- (postage 9d.)

HARBUTT'S PLASTICINE,

56, Ludgate Hill, E.C. 4, LTD.

AND

Bathampton, nr. Bath.

Agent: G. A. BENTALL, F.Z.S.,

392, Strand, LONDON, W.C. 2.

Vol. LV.]

OCTOBER, 1922.

[No. 713.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

CLAUDE MORLEY, F.E.S., F.Z.S.

C. J. GAHAN, D.Sc., M.A., F.E.S.

N. D. RILEY, F.E.S., F.Z.S.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C.2.

Cloth, foolscap 8vo. Price 3s. 6d. Postage 4d.

POCKET-BOOK of BRITISH BIRDS

By E. & M. ELMS.

"An inexpensive volume, which well deserves to be a 'pocket-book' for those who wish to become field ornithologists."—*Zoologist*.

"Contains more information on British Birds in a compact form than any book with which we are acquainted."—*The Auk*.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11.





Your very truly
D. Sharp.

THE ENTOMOLOGIST.

VOL. LV.]

OCTOBER, 1922.

[No. 713

DAVID SHARP, M.A., M.B., F.R.S., ETC.

1840-1922.

(Plate III.)

WITH the deepest feelings of regret we have to chronicle the passing away in the person of David Sharp of one from the very front rank of zoologists, and we would like to express our sympathy with his family and other relatives in their loss—a loss which will appeal also to many a naturalist. Sharp's reputation as a learned and highly scientific entomologist was world-wide, and he probably had few equals, if any, in his favourite Order, the Coleoptera. He wrote largely, and has left for those who follow in his steps a deep well of knowledge from which to draw. Such as knew him personally were particularly struck by the close touch and intimate association with living things that were always revealed when he spoke of his experiences in connection with insects and indeed with Nature in general. Such experiences, scarcely capable of transmission by writing, have gone to the grave with our late friend, and we cannot help feeling that there is something unsatisfactory in the nature of things, if so much of a man's life work, looked at from this point of view, seems almost to have been done in vain.

David Sharp was born at Towcester on 18th October, 1840. Some twelve years later his parents removed to London, where therefore, as a boy he received his education. After attending one or two preparatory schools, in 1853 he entered St. John's Foundation School which was then at Kilburn. At the age of seventeen he commenced to help his father, a leather merchant, and about the same time he began collecting beetles, some of his favourite haunts being Ken Wood and Hammersmith Marshes, as well as the sandy shores about Deal and Dover. As it was found that he had a great distaste for a business life, it was decided that he should qualify as a doctor. He accordingly, after studying for two years at St. Bartholomew's Hospital, went to the University of Edinburgh, where he obtained the degree of Bachelor of Medicine in 1866. After graduation he assisted a friend with his practice in London for a year or two. He had at first some thought of seeking an appointment in connection with entomology at the British Museum, but abandoned the idea; and about ten years later he went so far as to apply for the post of Curator of the City of Glasgow Industrial Museum, being recommended by H. W. Bates and Frederick Smith amongst

others. However, after his short residence in London he was offered a post as medical officer in the Crichton Asylum at Dumfries, which led to his taking charge of a case at Thornhill in the neighbourhood, where he joined the Dumfriesshire and Galloway Scientific, Natural History, and Antiquarian Society upon its reconstruction in 1876. This engagement gave him the leisure he desired for prosecuting the studies on which his heart was set, and it was during this period that he published some of his earlier papers. Here also his marriage took place. On the death of his patient about 1882 he returned to England and went to live at Southampton, but, finding it too far from London, after about two years he removed to Dartford. In 1885 he was invited to go to Cambridge as Curator of the University Museum. There he spent the next nineteen years of his life, till in 1904 he retired to Brockenhurst, where he had built a residence, Lawnside, on the very edge of the New Forest, facing the extensive heath of Black Knowl. Here he resided till his death on 27 August, 1922.

In 1862 Sharp became a Fellow of the Entomological Society of London and he was its President in 1887 and 1888, his presidential address being at the end of the former year on the subject of entomological collections, and of the latter on the senses of insects with special reference to that of sight. Between 1889 and 1903 he was on several occasions a vice-president, and he was on the Council from 1893–1895 and from 1902–1904. While living in London he was Secretary to the Society during 1867. In 1886 he became a Fellow of the Zoological Society, and he was on the Council from 1901–1905. The Linnean Society is also able to claim him as a Fellow since 1888; and he was connected by membership or correspondence with the chief entomological societies throughout the world. The high distinction of being elected a Fellow of the Royal Society fell to his lot in 1890, and the next year the University of Cambridge conferred on him the degree of Master of Arts, *honoris causa*.

David Sharp was the author of a very great number of papers and larger works. Being connected with the Entomologist's Monthly Magazine and the Entomologist, in either an editorial or a reference capacity, many of his numerous shorter papers appear in these magazines, and others in similar ones. Yet others, as well as some of his more pretentious papers, will be found in the transactions of societies with which he was connected. Perhaps his earliest contribution to entomological literature was a paper on the British species of *Agathidium* (Coleoptera) read before the Entomological Society of London on 6 November 1865. An interesting discussion on heredity and kindred subjects between Sharp and Wallace, arising in connection with Westwood's introduction of the subject of "mimicry" at the Entom. Soc. of London in November 1866, was reported in

the Athenæum of 1, 8, and 15 December 1866, and gives Sharp's views at the time on this subject. *A Revision of the British Species of Homalota* (Coleoptera) was published by the Entom. Soc. of London soon after his graduation at Edinburgh. In November 1873 appeared a paper in Spanish—*Especies nuevas de Coleópteros* por Don David Sharp. This refers to insects collected by his friend G. R. Crotch, whose obituary notice Sharp contributed to volume xi of the Entom. Monthly Magazine. *The Object and Method of Zoological Nomenclature* appeared in November 1873. This is an important and well thought out paper on a debateable subject, the argument of which is perhaps summed up in the sentence, "Nomina si nescis, perit et cognitio rerum," which appears on the cover. A short paper on the *Coleoptera of the Scotch Fir* came out in the Scottish Naturalist about this time. The *Dascillidæ of New Zealand* was published in the Annals and Magazine of Natural History in July 1878; while work on the water-beetles was taken in hand for publication by the Royal Society of Dublin. Sharp and Fowler's *Catalogue of the British Coleoptera* appeared in 1893; the *Rhynchophorous Coleoptera of Japan* in 1896; the articles *Insecta* and *Termites* in the Encyclopædia Britannica in 1902; and an article on the *Orders of Insects*, a subject in which Sharp was much interested, in the Entomologist for 1909. The *Distribution of Plants and Animals on the Globe* (a paper read before the Dumfries Nat. Hist. Society in 1883); *Stridulation in Ants*, 1893; an *Account of the Phasmidæ*, 1898; and the *Grouse-fly*, 1907, are away from his special order—Coleoptera; while *A Scheme for a National System of Rest-Funds (or Pensions) for Working People* (1892) shows that Sharp could detach himself from entomology when he wished to do so.

We have still to notice the larger works, on which the author's claim to distinction chiefly rests. Papers on the Coleoptera of the Hawaiian Islands had been published by the Entom. Soc. of London in 1878, 1879 and 1880. These were followed in 1899 and 1908 by the *Fauna Hawaiiensis* brought out by the Royal Society. Of even more importance is the *Beetles of Central America*, prepared chiefly from material collected by Godman and Salvin, and published in 1894 and later years in that monumental work known as the "Fauna Centrali-Americana." In 1895 appeared the first volume of the *Insecta* in the Cambridge Natural History, this being followed by the second volume in 1899. Of their influence on the advancement of entomology, and especially of our knowledge of insects as living things, too much cannot be said. Their enormous sale has prevented the appearance of a new edition, which their author would have liked to bring out. One point especially which he wished to emend was the classification of insects into Natural Orders, his views and suggestions on which will be found in the paper in the Entomologist to which reference has already

been made. In 1910 the *Insecta* was translated into Russian. In 1912 the Entom. Soc. of London, with the assistance of the Royal Society, brought out as Part III of the Transactions *The Comparative Anatomy of the Male Genital Tube in Coleoptera* by Sharp & Muir, an exhaustive treatise of 166 pages, and 37 plates. All the families were examined, and the results of the multitudinous dissections are given in detail. This work is of first-rate importance.

Perhaps, however, the annual volume of the *Zoological Record*, published by the Zoological Society, is the work for which most credit should be given. This is a list of the publications for the year in all branches of Zoology, British and foreign, classified under the headings of author and subject. Sharp was editor for the whole and recorder also for insects. No one, unless he has seen something of the work involved, can imagine the amount of detail to be sifted, and the care and knowledge required to prevent errors. He entered on this work, which was to some extent a labour of love, in 1892, and his methodical treatment of the publication greatly improved it in every way. This work he continued till the year of his death, even completing the reading of the final proofs of records for 1920 during his last illness.

When quite young—about seventeen or eighteen—Sharp went with his father to Switzerland, and greatly enjoyed the trip. More than once in later days he went to stay with Oberthur in France. The loss of his friend G. R. Crotch, Librarian to the University of Cambridge, was a great grief to him. They had been closely associated in entomological work, and had made several excursions together—to the New Forest, to Rannoch, and to Spain. Sharp often spoke of the primitive conditions in years gone by to be found in the New Forest and in Scotland, and told amusing stories of their difficulties in the way of procuring food and lodgings. With another friend, Bishop, he visited Sherwood Forest, and the last letter he wrote during his illness was to this friend, who died only so recently as 26 August last.

Sharp knew most of the British naturalists of his time—Huxley, Bates, Wallace, Buchanan White, etc. He was a great friend of Spencer, and in 1904 wrote an article in the *Zoologist*, entitled *The Place of Herbert Spencer in Biology*, having particular reference to him in connection with the teachings of Charles Darwin.

In Brockenhurst Sharp worked assiduously with one of his daughters (now Mrs. Muir) in his entomological laboratory elucidating the life-story or the anatomy of numberless insects, chiefly Coleoptera, or adding to his extremely valuable collection of British beetles, which we understand passes to Mrs. Muir. His interest, however, seemed to grow less when working alone, especially during the last year or two of his life. To the last

Nature, whether exhibited on the animal or vegetable side, attracted him, and until a few months of his death he might be recognised by his rapid stride, slight stoop, and long white beard, as he took his almost daily walk into the Forest he loved so well.

W. J. LUCAS.

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

BY W. G. SHELDON, F.Z.S., F.E.S.

It has always been the case that those Lepidopterists whose names have come down to the present time, and who will live in the future through their entomological work, have possessed copies of the principal books their predecessors or contemporaries have written on the subjects of their studies. This must necessarily be the case with all who propose to do original work, because unless it is known what has been written by others, it is impossible to form an accurate opinion as to whether a particular fact or idea is new or not. In our own country all the great Lepidopterists of the past have possessed libraries, extremely complete ones many of them; J. F. Stephens, John Curtis, Stainton, T. A. Chapman, J. W. Tutt, Henry Doubleday, Edmund Newman and Lord Walsingham are a few who acquired every book they could meet with that would be of assistance in their studies; as an instance of this the library of J. F. Stephens in 1852, at the time of his death, consisted of 1150 volumes; it was purchased *en bloc* by Stainton, and the latter possessed many other books on entomology. The library of the late T. A. Chapman consisted of practically everything of importance that had ever been written on Palæarctic Lepidoptera, and must have consisted of at least 2000 volumes. The library, world famous, which was acquired by the late Lord Walsingham, is, of course, in the Natural History Museum. In addition to being practically complete so far as the owner's studies were concerned, it possesses many priceless unique gems, such as the original plates of Godart and Duponchel's great work. Even to those who do not aspire to do original work a library is an extremely desirable possession. It is not possible to get anything like the full amount of enjoyment out of one's study without one. For instance, I pick up a magazine and become interested in an article on a certain species. In this article the writer refers to an author on a point which can only be appreciated or understood by turning up the reference in that author; and when this has been digested it is often found that a further reference to another book is necessary; and before the point is satisfactorily dealt with some half-dozen books must be consulted. Now, how is one to get on unless all

these books are available to refer to? It is true there are certain public or semi-public libraries which can be referred to to a limited extent; but there are only two libraries in Great Britain possessing a practically complete entomological library—those of the British Museum (Natural History) and the Entomological Society; the former does not loan out books at all, and the governing body of the latter is compelled to prohibit the loan of its more valuable, and especially of its irreplaceable works; and thus many of the books one wants to consult can only be seen in the libraries, and cannot be removed; of course, the difficulty of consulting them even under these conditions is emphasised the further one lives from London. If we want, therefore, to consult the beautiful books—and many of them are extremely beautiful—that have been published in the last 200 years, the only recourse is to purchase as many as possible and to treasure them upon our bookshelves.

Unfortunately for themselves, and the science, many lepidopterists do not seem to know or appreciate the intense interest that can be obtained from the perusal of its literature. We have had men, quite a number of them, who would spend hundreds of pounds at a single sale of British Lepidoptera, and yet when their effects came into the market it was found they did not possess more than half a dozen books; every man to his taste, of course, but surely postage stamp collecting is at least as intellectual, and more useful, for there is some geography to be learnt thereby! I would like to suggest that before giving £15 or £20 for an aberration of a butterfly, it might be interesting, and even profitable, to ascertain if it is equally rare abroad as with us.

At the sale of the Farn Collection a black aberration of *Melanargia galatea* was described in the catalogue as unique; probably it was, as a Britisher; £32 was paid for it, but this form is by no means unique on the other side of the Channel! I could give other instances! To buyers of such I would commend a glance through the plates of such authors as Hübner, Herrich Schäffer, and Milliere; they might see something there that would interest them!

The present paper is an attempt to make the more important books and their present values better known, and, one hopes, more appreciated. It is obvious that in a magazine article only the more important books can be referred to for reasons of space, and that the particulars of these must be cut down as much as possible.

In the following list the prices I quote are based upon (1) either my own estimation of the current values of the works, or (2) the prices that have appeared in the catalogues of the second-hand booksellers. Unfortunately since the war very few of these catalogues have been issued, and in some cases I have

had to refer to catalogues dating from 1912 or 1913; prices since then have advanced 20 or 30 per cent. Whether these advances are permanent time alone can show, but it is certain that the older and rarer books are getting scarcer every year by absorption into the libraries of museums and other public institutions, both in this country and abroad, and especially in America. As I have previously pointed out on page 92 of the present volume, the result of recent sales by auction has been extremely disappointing. Entirely through the want of interest displayed by lepidopterists the dealers have been allowed to reap rich harvests, and have obtained extremely valuable books for a mere song, thereby realising in a few days a profit of, in some cases, 2000 or 3000 per cent.

In dealing with the books *seriatim* it will perhaps facilitate reference and lead to greater clearness if I arrange them alphabetically and keep those issued in each country together. But before doing this I would like to refer to two works of exceptional utility.

It is obvious that the first need of a student of the Lepidoptera is an efficient catalogue that will put him up in the particulars of books that have been published, and also of one that will give the references to everything of importance that has ever been written about each species.

The only book as a single volume, or rather two volumes usually bound together, that has ever been written on the bibliography of the science, is *Bibliotheca Entomologica*, by H. A. Hagen (Leipzig, 1862), an excellent and careful work that gives particulars of all works or papers of importance that had been written to that date. It is not an expensive work. My copy cost 15s. a few years ago; it is now priced at 20s.

There are, of course, the volumes of the *Zoological Record*, which I will deal with later on.

The bibliography of each species is described in *Catalog der Lepidopteren des Palæarctischen*, by Staudinger and Rebel, the 1901 edition (Berlin: R. Friedländer & Sohn), published at 12s., and probably still to be had from the publishers at about that figure. This is absolutely the most important book in existence for a student of the Lepidoptera of this region or of any part of it; one cannot move without it. There are errors, of course, plenty of them, but it gives us the references of the most important works dealing with the almost 10,000 species inhabiting the region. There are other catalogues in process of issue, but apart from the fact that they are very expensive, they are too fragmentary at present to be of much service to the student.

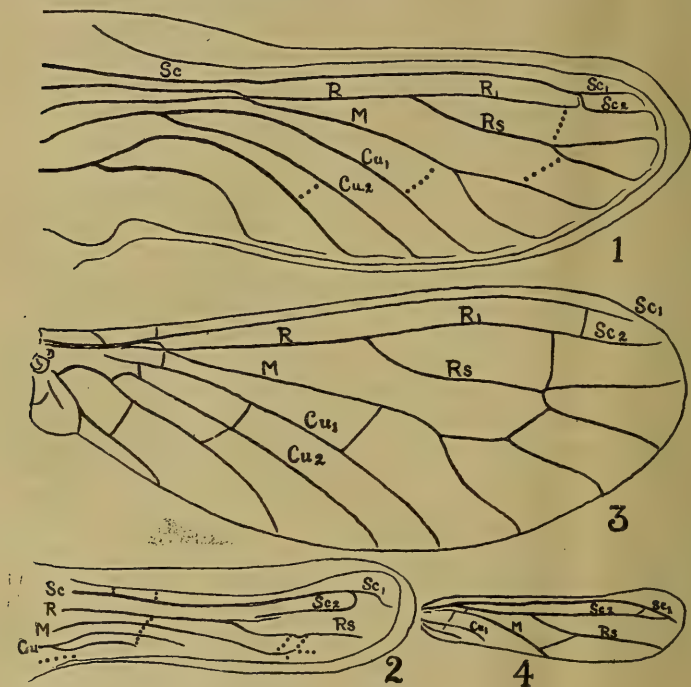
An extremely useful article entitled *The Present Prices of the Older Works on British Entomology*, by Mr. South, appeared in vol. xxxi, pp. 261-264, of this magazine; to this I refer my readers.

(To be continued.)

THE WING VENATION OF THE CONIOPTERYGIDÆ.

By C. L. WITHYCOMBE, B.Sc., F.E.S.

IN my last note on the Coniopterygidæ I described the venation of the forms under consideration in terms of Comstock's system, applying such names to the wing veins as are given in his book *The Wings of Insects*. This was done for the sake of simplicity, while realising full well that some of the implied



Conwentzia psociformis.—Fig. 1 fore wing, fig. 2 hind wing of pupa $\times 66$;
fig. 3 fore wing, fig. 4 hind wing of imago $\times 26$.

homologies were not exactly correct. Strictly, the venation is not so simple as at first sight appears.

I had then worked out the pupal venation of *Conwentzia psociformis*, Curt., and was hoping to complete my study with that of *Semidalis*, given by Comstock as typical of the Coniopterygidæ. Unfortunately my larvæ of *Semidalis*, bred in captivity, are, I fear, not going to emerge this year as a second brood, probably as a result of the cold season. Therefore the venation of *Semidalis* cannot be settled this year.

The fore wing of *Conwentzia* is of fairly normal type, but the hind wing is strongly reduced, with correspondingly interesting results in the venation.

The figures will largely explain themselves, so that a detailed description is unnecessary. In the pupal wing the tracheæ of the future veins are shown as black lines. The pale vein cavities, visible in the pupal wing but lacking a trachea, are shown as dotted lines. These, of course, should appear in the imaginal wing as veins, though sometimes difficult to see. The figures of pupal wings are drawn to a larger scale than the imaginal wings.

Comparison of the fore wings of pupa and imago shows that the apparent cross-vein between Sc and R_1 is really Sc_2 , and the terminal portion of apparent R_1 is also Sc_2 . The trachea of R_1 ends by bending anteriorly along the cross-vein, and does not continue to the outer margin. No other cross-veins in the wings are preceded by tracheæ. Another interesting point in the venation of the fore wings, in all Coniopterygids, is the apparent crossing of radius and media in the basal fourth of the wing. From the pupal venation this is seen to be only an approximation of the two veins, which then diverge.

The hind wings are very peculiar, and in the pupa appear to promise a more complex venation than actually matures. Sc and R_1 apparently coalesce at their extremities. This is not truly so. R_1 often does not exist in the pupal wing, its place here being taken by the recurrent Sc_2 . More usually, however, R_1 has been found present, though short and weak. The radial sector is well developed, and its trachea is bent slightly at the future point of junction with the cross-vein to media. The media is unbranched. Cu_1 and Cu_2 are both present, but although the pupal wing shows a pale channel for an anal vein, there is no trachea to be seen within it.

The main interest of the venation is the bifurcation of the subcosta. The presence of Sc_1 and Sc_2 is generally regarded as primitive, and since the Coniopterygidæ are admittedly archaic in many respects, though highly specialised in others, this additional primitive character is of interest.

Walthamstow;

August 26th, 1922.

TROIS LEPIDOPTÈRES NOUVEAUX DE LA RIOJA, RÉP. ARGENTINE.

PAR E. GIACOMELLI.

1. *Psectrotarsia tamsi*, sp. nov.

Port et taille de *Psectrotarsia fuscirena*, Hamps. Côté supérieur : Primaires d'une couleur verte ochracée claire tendre, tout uniforme. Les secondaires blanches, avec une bande brune au bord, suivante parallèlement à toute la frange ; cette bande disparaît dans quelques

exemplaires. Franges blanches. Tête et thorax de couleur verdâtre très pale comme les primaires. *Côté inférieur* : Toute la surface des ailes est blanche, unicolore. Palpes, pattes, abdomen, inférieurement blanc, ce dernier supérieurement blanc jaunâtre crétacé. Yeux gris, antennes jaunâtre clair.

Exp. alar. ant. 28 mm.

Quelques exemplaires de la Rioja (R. Argentine). Usine de la lumière électrique. Il ne semble exister de différence marquée entre le ♂ et la ♀. États préparatoires inconnus pour moi.

J'ai le plaisir de dédier cette espèce à mon ami distingué, Mr. W. H. T. Tams, du British Museum.

2. *Thyreion riojana*, sp. nov.

Un peu plus petit que *Thyreion olivofusa*, Dogn., et d'une stature plus gracile. L'espèce semble variable, quelques exemplaires sont supérieurement presque uniformes, jaune clair, crétacée, presque blanc. Dans quelques exemplaires (♀ ♀ ?) les secondaires deviennent grisâtres, fumeuses, et on observe une ligne de points très fins, parallèle au bord extérieur, nets, mais à peine visibles. Le côté inférieur est blanc à peine jaunâtre, uniforme, sauf une tache triangulaire fumeuse qui part de l'angle intérieur et se repand vers le bord externe plus ou moins marquée selon les exemplaires.

Corps, antennes, pattes et abdomen blanc jaunâtre comme les ailes.

Exp. alar. ant. 22-23 mm.

6 exemplaires chassés à la lumière électrique, La Rioja (R. A.). États préparatoires inconnus pour moi.

3. *Tolyte fumosa*, sp. nov.

Couleur du fond, légèrement rougeâtre ou rouille, presque cachée par les dessins noirs. Les ailes sont gris fumeux, plus dense vers le bord antérieur et à l'angle postérieur des 2^{èmes}. Cette couleur de fumée est formée par des lignes peu voyantes qui partent du bord antérieur vers le postérieur, dans lesquelles s'en détachent principalement deux plus nettes au première et 2^{ème} tiers basale. Tête, thorax et abdomen supérieurement de la même couleur fumeuse encore plus intense, surtout sur les pterigodes. Sur les ailes les nervures se détachent assez clairement.

Côté inférieur du corps et ailes aussi fumeux, les primaires légèrement opalines vers le bord externe, les secondaires au centre; l'abdomen blanchâtre inférieurement. Antennes jaunes, yeux bruns.

Exp. alar. ant. 21 mm.

Les 4 ♂ ♂ chassés à l'Usine de la lumière électrique, de La Rioja, présentent des légères différences individuelles, deux tendent plus à la couleur de rouille, que les autres deux plus fumeux.

Nous possédons un exemplaire un peu plus grand (32 mm. exp. alarum), que nous jugeons être la ♀ des antérieurs. Elle a

absolument le port et le dessin de notre *Tolyte bipunctata*, Giac., décrite en *Lepidopteros riojanos nuevos o poco conocidos* (Anales Soc. Cientif. Argentina, T. lxxii, pag. 19, Año 1911), mais la couleur générale est fumeuse, presque noire, semblable aux ♂♂ ici décrits. Elle possède bien marqués les deux points caractéristiques de *bipunctata* dans la même position; peut-être *bipunctata* et cette ♀ pourraient être deux formes de la même espèce.

Cette ♀ a été chassée dans le même endroit que les ♂♂ décrits. États préparatoires inconnus.

La Rioja,
Rép. Arg.

OBSERVATIONS ON THE BIOLOGY OF SAWFLIES.

By A. D. PEACOCK, M.Sc.

THE following notes are summarised from observations extending over the period autumn, 1920, to autumn, 1921, the flies being reared in the laboratory from larvæ usually collected in the field. Unless otherwise stated, the imagines were fed on a syrup of sugar and water, which was almost invariably accepted, given access to water, and provided with a twig of their natural plant in water or with a potted plant. Plant and insect were caged in a large glass bell-jar or other suitable glass vessel. I am greatly indebted to Miss E. F. Chawner for certain larvæ, and for giving me the benefit of her wide experience in rearing sawflies. My thanks are due also to the Rev. F. D. Morice, M.A., for the identification of the adult insects.

PARTHENOGENETIC SPECIES AND THE RESULTS OF THEIR EGG-LAYING.

The names of the experimental insects are according to Enslin's list (1), and for convenience the genera are arranged in alphabetical order.

**Allantus (Emphytus) serotinus* Müll.—Specimen 1: 6 eggs laid; hibernating 1921–1922. On oak.

**Allantus (Emphytus) pallipes* Spin.—All appear fertile; produced females only. On violet and viola.

Nematinus fuscipennis Lep. (*abdominulis* Panz.).—Specimen 1: 5 larvæ from 10 egg-holes. On alder. Specimen 2: 9 larvæ from 24 egg-holes; failed to rear the larvæ. On alder.

**Nematinus luteus* Panz.—Eggs (a few) which failed to hatch. On alder.

**Pachynematus obductus* Htg.—All eggs laid appear fertile; larvæ hibernating 1921–22. On *Poa* sp.?

Pristiphora pallipes Lep.—All eggs appear fertile: two broods of larvæ reared during the summer of 1921 yielded all females; from Miss Chawner's experiments, 1920–21, it is possible that

the rarer male may appear in the spring after hibernation. On gooseberry.

**Pristiphora ruficornis* Ol.—All eggs appear fertile; failed to rear larvæ. On hawthorn.

✓ *Pteronidea pavidæ* Lep.—Specimen 1: All the 62 eggs collapsed and did not hatch. On willow. Specimen 2: A batch of 56 eggs; all except 1 fertile; larvæ hibernating 1921–22. On willow.

✓ **Platycampus luridiventris* Fall.—Specimen 1: 2 larvæ from 7 egg-holes; failed to rear. On alder.

I failed to obtain parthenogenetic eggs from 5 specimens of *Amauronematus vittatus* Lep., using alder and birch, the plants upon which the larvæ had been found and reared. I am investigating the matter of food-plants of this species, which is regarded as attached to willow.

The specimens starred are not recorded as parthenogenetic in the lists of Cameron (2) and Enslin.

Regarding the alder species *N. fuscipennis*, *luteus* and *P. luridiventris*, which lay deeply in relatively hard plant-tissue, it is impossible to say whether each egg-hole made contained an egg or not. From my observations on the insects while they went through this performance, however, I should say that each hole did contain an egg.

NUMBER OF PARTHENOGENETIC EGGS LAID AND THE RATE OF LAYING.

Species.	Total laid per insect.	Individual rate of laying.
<i>A. serotinus</i>	6	. 3 in 7 days; 4 in 10 days; 6 in 14 days.
<i>A. pallipes</i>	—	. Spec. 1: 12 in 30 minutes.
	—	„ 2: 3 „ 30 „
	—	„ 3: 8 „ 30 „
	61 from 2 flies	. Specs. 1 and 2: 61 in 6 days.
	55 „ „	„ 3 „ 4: 55 „ 5 „
<i>N. fuscipennis</i>	6	. Spec. 1: 6 egg-holes in 24 hours.
	10	„ 2: 10 „ 15 „
	25	„ 3: 25 „ 24 „
		(In the green stalk of leaf, egg laid in 4 minutes; in harder brown stalk, 7 minutes.)
<i>N. luteus</i>	—	. Spec. 1: None.
	20	. Spec. 2: 12 egg-holes in 24 hours; 20 in 48 hours.
<i>P. obductus</i>	20	. Spec. 1: 6 in 24 hours.
	10–12	„ 2: 10–12 in 7 days.
<i>P. pallipes</i>	80 from 3 flies	—
<i>P. ruficornis</i>	16	—

Species.	Total laid per insect.	Individual rate of laying.
<i>P. pavida</i>	57	None in 4 days; 6 after 4 days; 51, laid in about 10 hours, after 5 days.
<i>P. luridiventris</i>	—	Spec. 1: 7 egg-holes in 4 days. " 2: 3 " 5 (In green stalk of leaf, egg laid in 3-5 minutes.)

PROMPTITUDE IN LAYING AND RELATION TO FEEDING.

In all the succeeding cases, except where otherwise stated, the flies were obtained a few hours at most after emerging and then given opportunity to feed on sugar syrup.

A. serotinus.—A single specimen laid after 7 days.

Allantus pallipes, and *Pristiphora pallipes*.—Both these laid immediately after hatching and feeding. They also laid normal eggs in the normal fashion without feeding. In these latter experiments moisture in the form of condensation on the glass cage was available but whether it was taken or not was not observed.

N. fuscipennis.—In two experiments the flies were kept fasting with their host plant, alder, for 4 and 5 days respectively. Neither laid. But immediately after a feed of sugar syrup both commenced laying.

N. luteus.—One specimen produced eggs one day after emerging and feeding, but another, despite frequent meals, never laid.

P. obductus.—One specimen laid almost immediately after emergence and feeding while a second delayed for about a day.

Explanation of the complete failure to hatch of the eggs of *Nematinus luteus* and *Pteronidea pavida* I am unable to offer.

EMERGENCE OF ADULTS.

Premature emergence.—In three instances this phenomenon has been observed. About the end of May, 1921, a caterpillar of *Allantus serotinus*, a non-spinner, went to ground in a litter of peat, sand and coconut fibre. On June 4th it was placed in a small corked bottle under about $\frac{3}{4}$ in. of litter. Three months later, September 2nd, a green male pupa was found on the surface, where it remained on its back for 16 days when it became active. Two other specimens did not emerge from litter till ready for adult life.

The second case concerned *Pteronidea pavida*, which went into the litter to spin about July 15th. The cocoons were kept under conditions similar to the above. A month later, August 15th, a light green male pupa appeared on the surface and lay there for 8 days before becoming active. Five other specimens behaved normally.

About July 12th specimens of *Pachynematus obductus* went into litter, spun cocoons and kept as noted above. On July 25th a green female pupa was found on the surface, where it lay 2 days before adult activity. No other specimens behaved so.

These laboratory results are too insufficient to warrant much comment. In no case was the metamorphosing insect disturbed. The appearance of *A. serotinus* on the surface could be explained on the grounds that the pupa, unencumbered by a cocoon, by its wriggings—pupæ at times do wriggle vigorously in a corkscrew fashion—managed accidentally to reach a higher level. But in the other two cases explanation is not so ready because the specimens belong to cocoon-forming species. Unfortunately my notes do not record any facts as to the condition of the cocoons, so the significance of these emergences remains obscure. Either the specimens spun feebly, in which case the cocoon-spinning instinct is liable to vary, or the pupæ were able to free themselves prior to adult activity. If the former happened emergence could be explained by pupal wriggling; if the second, the conditions governing emergence required further investigation. Under natural conditions, unless some superficial shelter were obtained, this faculty would be of very doubtful survival value to the individual or species. The phenomenon does not appear to be sexual. MacGillivray (3), whose papers came into my hands since writing these notes, has already had similar experience, on which he writes: "Just before they are ready to cast their larval skins and become pupæ, they may leave their cocoons or earthen cells or tunnels in rotten wood and force themselves to the surface of the soil, where they will remain as if dead, only wriggling the body when disturbed. Such may pupate . . . and produce adults or they may die." As I only observed pupæ on the surface, I cannot give any information regarding the behaviour of the larvæ.

Emergence of the sexes.—Attention in the following instances has been confined to experiments in which I have reared the insects from fair numbers of eggs or larvæ. The number of emergences, however, is somewhat small. Females emerging first: *P. pavidus*, 4 females out August 7th to 14th, 1921, then 4 males August 15th to 26. *P. luridiventris*, 4 females out June 18th to July 4th. No males. There is good reason for thinking that *N. fuscipennis* and *A. vittatus* behave similarly. Males emerging first: *A. serotinus*, 2 males out September 18th, 25th, 1 female October 5th. *P. ruficornis*, 1 male July 13th, 2 females July 15th, 19th. *P. pallipes*, 1 male April 3rd. First females June 21st. (Miss E. F. Chawner's experiment.)

SEXUAL BEHAVIOUR.

While visiting the Edinburgh Botanical Gardens on September 7th, 1921, a very hot day, a large number of *Athalia*

lineolata Lep. were observed swarming in the sun over beds of *Ajuga reptans*. The great majority were males, but couples were observed in copulation. Two females and eight males were captured, placed under a glass jar covering a patch of planted *A. reptans*, and observed for a week. Copulation occurred at intervals, and lasted for at least some minutes. No eggs were laid—I was unaware then that the species lays on oak—but this did not seem to affect the mating process. Polyandry was not observed, but I think it very probable.

Pristiphora ruficornis.—In one experiment a single male and female kept in a large glass jar with a hawthorn twig for four days, and given opportunity to drink and feed, were never observed to mate.

Amauronematus vittatus.—Mating was not observed, during observation lasting one hour, of flies in a small glass vessel which capped a small alder twig.

REFERENCES.

- (1) ENSLIN, E.—“Die Tenthredinoidea Mitteleuropas,” Deutsche Ento. Zeit. Jahrgang, 1912–17.
- (2) CAMERON, P.—Phytophagous Hymenoptera.
- (3) MACGILLIVRAY, A. D.—“The Immature Stages of the Tenthredinoidea,” contribution from the Ento. Labs. Univ. of Illinois, U.S.A., No. 38, and papers from the Maine Agric. Expt. Stn., Ento., No. 70.

Armstrong College,
Newcastle-on-Tyne;
February 7th, 1922.

NOTES AND OBSERVATIONS.

NEW NAMES FOR OLD.—In February, 1910, I published in Trans. Linn. Soc. (2nd ser., Zool.), vol. xiii, pp. 304–305, the description of a Pyralid moth from Praslin, Seychelles, under the name *Nacoleia maculalis* Fletcher. As I now find that my name is an absolute homonym of *Nacoleia maculalis* South (Trans. Ent. Soc., 1901, p. 462, t. 14, f. 7), described from Central and Western China, the Seychelles species may be renamed as *insulicola* **nom. nov.** The generic name *Nacoleia* Wlk., 1859, is ante-dated by *Lamprosema* Hb., Verz., p. 361, 1826.

The generic name *Arbela* Moore (P.Z.S., 1879, p. 411), in Lepidoptera, is a homonym of the Reduviid genus *Arbela* Stål (Hem. Afr., iii, pp. 38–42, 1865). In vol. i on moths in the Fauna of British India, p. 314, 1892, Sir George Hampson founded the family Arbelidæ on *Arbela* Mo., but this family name has since been changed to Teragridæ, founded on *Teragra* Wlk., the first described genus contained in it. The African genus *Teragra* is, I believe, not identical with the Indian genus *Arbela* Mo., which is now renamed *Indarbela* **nom. nov.**, type *tetraonis* Moore.—T. BAINBRIGGE FLETCHER; Pusa, India, July 31st, 1922.

NOTES FROM THE ALTON DISTRICT, HANTS (LEP.).—On June 10th there emerged from a mixed lot of pupæ *Hydrelia uncula*. As I had no marsh larvæ or pupæ, the only explanation possible is the following: The preceding autumn, passing the swamp near Oakhanger,

I filled my pocket with a couple of handfuls of clean sphagnum. This reposed in a box on top of a bookcase all winter, exposed to heat and fumes of gas in a sitting-room. In the spring I wrung it out in very hot water and used it to bed some wintered pupæ on. A few evenings after the emergence I went down to the swamp to see if *H. uncula* occurred there, and, sure enough, a few specimens were flying. It is amazing that a pupa, accustomed to lie in a freezing marsh all winter, should endure such treatment. And what physiological mechanism secures that after all it should emerge at precisely the usual season? It is particularly exasperating when one finds that choice pupæ refuse to live through the winter in the most skilfully contrived cold storage. Another surprise was *Dianthaecia conspersa*. In 1920 I collected larvæ from *Silene* which produced a series of *D. carpophaga* in 1921. I took no more in 1921, so that *D. conspersa*, a species I had not met with here, must have lain over a year. This is the more surprising as the genus tends rather to be double-brooded than to lie over. I may say that here *D. cucubali* always appears as a second brood; even in this miserable summer it turned up on August 14th. *D. carpophaga* is, I think, single-brooded here; and *D. capsicola* is a rarity with me, of which I cannot speak. The third surprise concerns *Trochilium crabroniformis* (surely it should be *crabroniforme**?). Their borings are very numerous in our woods, and I secured three stumps this spring. The first emergence was a number of ichneumons, so that my expectations were reduced to two. But to my surprise three imagines emerged. Investigation of the stumps showed that two larvæ had pupated in one boring, and had presumably only the one exit. Had they spent their whole larval life in the same bore, which was only wide enough for one? I suspect that No. 1 made an exit hole and pupated, and then No. 2's bore converged on No. 1's (like the arms of a letter Y), and he proceeded to pupate between No. 1 and his exit. Fortunately No. 2 emerged first, and so cleared the way for No. 1, who would otherwise have been bottled up. Mr. Atkins, the woodman who brought me the stumps, is a keen observer, and informs me that he captured a large moth in a recent year which he identified as a "Clifden nonpareil." He is probably right, as it is difficult to mistake *Catocala fraxini*, but I wish he had kept it. As regards the season, the most notable feature among the butterflies is the abundance of the second brood of *Cyaniris argiolus*,† which has been about all through August and is flying in my garden to-day (September 11th). It seems clear that unusual heat early in the season sets a second brood on the way, and no subsequent cold can arrest it. July and August this year were far below the average in temperature, but *Demas coryli* came to light May 31st and August 9th, and its small larvæ and those of the "Prominents" are as numerous as usual. *Colias croceus* and *Pyrameis cardui* are present in fair numbers apparently—when the weather permits them to fly. When the weather broke at the end of June sugaring was very profitable for a time, and in a lesser degree throughout July.

* Lewin's original spelling of the name in Trans. Linn. Soc., iii, p. 1, 1797, is *crabroniformis*.—N. D. R.

† This appears to have been very general. I have never before seen it so abundant in the south-west district of London.—N. D. R.

The best additions to the Alton list were *Cosmia pyralina* and *Palimpsestis octogesima* in single specimens, with *Noctua stigmatica*, etc., and a beautiful series of *Eurois prasina* in very fresh condition. In every season one or more species of the commoner Lepidoptera is apt to predominate in numbers to an unusual degree. This season I was struck by the exceptional numbers of *Ligdia adustata* in May. The puzzling thing about this insect is the apparent discrepancy between its abundance and the scarcity of its food-plant. I had the curiosity to examine the hedges of a lane where it flew out of every bush one tapped, and in a quarter of a mile I could only detect two scrubby little bushes of *Euonymus*. Other unusually abundant species were *Euchelia jacobaeae* and *Leucania conigera*—the latter a perfect pest at light and at flowers in the garden. On the other hand, I have seen but one single specimen of *Spilosoma lubricipeda* in four years here! Can it be growing scarce? *S. menthastris* turns up at light as usual. It would be interesting to learn if others have had the same experience, or if the scarcity is merely local.—E. A. C. STOWELL; Alton, Hants.

NOTES FROM E. KENT (LEP.).—*Melitaea athalia*: Visiting a home of these insects on June 13th I found larvæ in plenty, nearly full-grown, also plenty of pupæ; on the same day imagines were on the wing. I netted about three dozen; all being typical I retained none. On June 24th I took a nice variety; the anterior wings have a small patch of brownish-orange at the basal area; the centres are obscured by a deep black band three-eighths of an inch wide at the costa, extending across to the dorsal margin, followed by six deep orange marks forming a narrow band; the outer margin has a deep black band one-eighth of an inch wide with usual fringes. The specimen is otherwise normal. I do not think this variety is mentioned in South's British Butterflies. *Colias croceus* (*edusa*): First noticed here on July 30th, when four specimens were taken. Between that date and August 20th ten others, including one var. *helice*, occurred. In 1921 I took thirty-two *C. hyale*, but saw no *croceus*. This season I have seen no *hyale*. *Sphinx convolvuli*: September 1st a large ♂ in fine condition was found in garden, resting during daylight, on foliage of *Nicotiana affinis*. On September 2nd a ♀ was netted at dusk hovering over the same plant. September 3rd, ♀ at dusk and two others seen. September 5th, one ♂ and one other seen. September 11th, netted a large ♀ very much worn.—H. G. GOMM; Westbrook, Margate.

COLIAS CROCEUS AND OTHER LEPIDOPTERA IN CUMBERLAND.—On August 29th I was shown a living specimen of *C. croceus* by the inevitable small boy, who had taken it about ten minutes previously and asked me if I could identify it for him. On September 1st and subsequent dates my son and I obtained specimens, all of which were in very beautiful condition. These were all netted on the shores of the Solway, and they appear to be confined to a very restricted locality; they were generally flying among the marram grass a short distance above high-water mark; we found none in the clover fields. *Hipoerita jacobaeae* used to be found in a few restricted localities in this county, but has gradually disappeared from them, and appears to have approached extinction. We found, however, the larvæ swarming

on ragwort at the commencement of September. They appeared to be confined to a patch of about five or six acres, and, though we searched the surrounding moorland carefully, we found none. This is singular, as the surrounding country does not vary in character, nor is the ragwort less plentiful. I had the opportunity of observing an ichneumon at work among the larvæ. She settled on the same leaf as her victim and alongside it; then her ovipositor suddenly flashed out twice. The larva appeared quite unconscious of the attack. One other capture is, I think, worth recording. Last winter I dug a pupa of *Odontosia carmelita* in a wood about three miles from Carlisle from which a perfect female emerged in May. The only other county record that I am acquainted with is the occasional appearance of this species at Keswick, some thirty miles away.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

COLIAS CROCEUS, ETC., IN DERBYSHIRE.—On October 30th, 1921, I chased a male *croceus* for some distance, but failed to capture it. On August 6th, 1922, I captured a female specimen evidently freshly emerged, and saw a second on August 31st on the Duke of Devonshire's land at Hardwick Park. At Ridgeway, near Sheffield, I saw a specimen on August 13th, and have also seen odd specimens in other areas as follows: Croxteth Park, Liverpool, May 25th; and in a hay-field a few miles north of Worcester on August 1st.

Referring to the recent notes in the Entomologist on possible hybridisation in nature, it may be of interest to note that on August 26th I found a female *Pieris brassicae* in cop. with a male *P. rapae*. These I brought home in a tobacco box in which they became separated. I kept them in a gauze cage over a growing cabbage plant, but they did not repeat the operation, neither did the female lay any eggs prior to her accidental release.—A. W. RICHARDS; High Street, Tibshelf, Derbyshire.

COLIAS CROCEUS IN NORTHUMBERLAND.—To the references to the occurrences of the clouded yellow in southern England this season, which have appeared in the Entomologist, it may be worth while to add that one was seen at Nunwick, Northumberland, on August 25th.—GEORGE BOLAM; Alston.

COLIAS CROCEUS IN LANCASHIRE AND WESTMORLAND.—Though this species occurs in this district only at rare intervals, it has spread this season as far north as Witherslack (Westmorland). I received on September 6th a ♂ which was taken there two or three days before. The specimen was in such fresh condition as to lead me to believe it had emerged in the locality, and the following day (September 7th) I visited the stretch of shore between Lytham and St. Anne's (Lancs) in the hope of seeing something of the species, and was rewarded by the capture of a fine ♀, the only one seen.—T. M. BLACKMAN; 27, Black Bull Lane, Fulwood, Preston.

COLIAS CROCEUS IN HUNTS.—I saw a male of this species flying high in Brampton Park on May 31st last, and several specimens were noted by other observers in the immediate neighbourhood. It was, therefore, no surprise to me to catch a freshly-emerged specimen at Spaldwick on August 5th. Since then I have captured nine others, including three worn males yesterday, in the same village

and at Brompton. I should no doubt have taken more but for the continued absence of sunshine, and the scarcity of clover and lucerne fields in this county.—(Rev.) GILBERT H. RAYNOR; Brompton, Huntingdon, September 9th, 1922.

COLIAS CROCEUS IN HANTS.—This species has been fairly abundant on the Portsdown Hills; I have seen about 150 in all. The first seen was on July 29th, which is rather earlier than usual. Females have been scarce, and only one var. *helice* has been taken by me, though I have heard of four others being captured. On September 11th, the last date I have been to look for them, I counted fifty-four.—(Rev.) J. E. TARBAT; Fareham.

POLYGONIA C-ALBUM, ETC., IN BERKSHIRE.—Since reporting the appearance of *Polygonia c-album* in this locality (Wallingford district) on July 12th of last year (Entom., liv, p. 243), it may be of interest to report that I have found single specimens since on the following dates: September 3rd, 1921; May 16th, 1922; and August 18th, 1922. There is reason therefore to think that this insect has established itself here, following the migratory influx which apparently took place in the spring of 1921. I was interested to hear of Mr. G. B. Oliver's attempt to introduce *Agriades bellargus* (*adonis*) in the Chilterns. I hope the experiment will prove successful. On August 20th I spent the day on the edge of the Chilterns between Wallingford and Nettlebed (my only visit this year). Though a dull day butterflies were plentiful, but sluggish owing to the absence of sunlight. *A. corydon* was common and in splendid order. *Colias croceus* was also to be found here and there among the clover-fields. *Melanargia galatea* was as usual fairly abundant, though not now in the best condition. *Aricia medon* (*L. astrarche*), common. I have been away most of this summer, and consequently devoted but small time to entomological pursuits. *Agrotis obscura* was common here at Shillingford at the end of June and beginning of July of this year. I found several at "honey dew" on the rose trees, and many others caught in spiders' webs in our loft, where they had been entrapped while seeking out the "honey dew" on the rose tree just outside. I have not seen this Agrotid before in this part of the country.—MORRIS BOORNE; Shillingford, Wallingford, Berks.

POLYGONIA C-ALBUM IN HERTS.—In connection with Mr. Tite's capture of *P. c-album* at Tring on May 6th (Entomologist, June, 1922), I should like to record that I captured a specimen at Wendover on July 31st, 1922. This surely belonged to the summer brood—hardly expected in such an unfavourable season. They have also occurred lately at another spot near Tring, the latest capture being on August 26th, 1922.—R. B. BENSON; Boldre House, Charles Street, Berkhamsted.

THANAOS TAGES: SECOND BROOD.—Two specimens were taken, and a few others seen, on August 26th, on the South Downs, near Winchester.—FREDK. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

MANDUCA ATROPOS IN BUCKS.—On August 1st I visited the Bucks Chilterns. Here I was informed by a countryman that he had

caught a specimen of *Manduca atropos* a few weeks previously. The moth had been taken at rest in the daytime.—J. A. BROWN; "Keston," Whitechurch Lane, Edgware, Middlesex.

[Two full-grown larvæ of this species were received by the Entomological Department of the British Museum on August 23rd for identification. They had been found by Mr. D. Jones on jasmine at Stony Stratford.—N. D. R.]

HYLOICUS PINASTRI IN SUFFOLK.—Between August 1st and August 16th I took sixteen specimens of *Hyloicus pinastri* in the Saxmundham district, Suffolk. I found them all by searching pine trunks, on which they show up quite clearly, even when seen from some way off. The greatest height at which I noticed the insect was rather less than five feet up a trunk; the average height was between two and three feet; in several cases the moths were almost on the ground. They could, without exception, have been seen by viewing the trees from the south-east; sun and wind do not seem to affect them; the north side failed to produce even a single specimen. It is unnecessary to search the trunks closely, for *pinastri* can be seen at a glance (if there is one to be seen). Its occurrence appears to be very "patchy"; where one is detected it is probable there will be others.—M. MACTAGGART; Moorcroft, Gravel Hill, Bexley Heath, Kent.

HERSE (SPHINX) CONVULVULI AT EASTBOURNE.—On the evening of August 26th, at dusk, it being almost calm and fairly warm at the time, I noticed a large Sphingid hovering at a poppy flower that was growing in proximity to a patch of tobacco blossoms in my garden; I had no doubt as to it being *H. convulvuli*, but by the time I had obtained a net it had gone. On the 29th another eluded me. On September 1st I captured two which proved to be, as I expected, this species; on the 2nd three were seen and two of them taken, one of them at the time of capture feeding at blossoms of sweet pea, but all the others seen were at the tobacco blossoms. On the 3rd the moon was very bright and a light northerly breeze was blowing, and the only two or three seen dashed wildly about the blossoms without attempting to feed. The evenings of the 4th and 5th were overcast, and on each of them a capture was made; the 6th was bright moonlight and the wind well in the east, and the only moth seen flew wildly, and this was the last seen of the species. The patches of tobacco blossom worked were scattered over a considerable area, and, as a moth seldom stays very long at any one lot of blossoms, it is probable that the species has been really more common in this neighbourhood than the half dozen captures would suggest.—ROBERT ADKIN; Eastbourne, September 16th, 1922.

HERSE CONVULVULI IN LONDON.—On September 7th I had an urgent request for a killing-bottle from my friend, Mr. Holmes, of 32, Felday Road, Lewisham. The previous evening his mother had knocked something off a statue in their garden which seemed to be alive, and, seeing it was a large moth, put it in a glass jar. It turns out to be a fine female specimen of *H. convulvuli*.—J. H. VICKERS; 16, Talgarth Mansions, Barons' Court, London, W.

HERSE (SPHINX) CONVULVULI IN CAMBRIDGESHIRE.—*Sphinx convulvuli* is somewhat abundant here this year. I have taken nine specimens in good condition in my garden on *nicotiana*, from August 30th to September 6th, when I ceased taking them. They were all but one taken between 8 and 11 o'clock at night. One was taken in the twilight, but that was the only occasion on which I went out before 8 o'clock. I was never out after 11 o'clock. I still see one or more almost every night at various times between 8 and 11 o'clock. Their apparent curiosity mentioned by Barrett in his British Lepidoptera was very noticeable. Usually when the light was thrown on them they became fidgety, and some left the flowers and flew backwards and forwards a yard or two from me several times, and then a few times at a rather greater distance, and then went off; but sometimes they returned at once to the same bed of flowers. A white straw hat I sometimes wore seemed, on several occasions, to be of great interest to them, and they flew round it and within a few inches several times before going further away. They were all males but one. I also took a rather worn male here last October at rest on a curtain in the billiard-room. The specimen recorded as taken here in June was also a male. This sex this year seems to predominate largely. The times above mentioned are times according to the sun (Greenwich time), and not the statutory summer times.—A. HAROLD RUSTON; Aylesby House, Chatteris, Cambridgeshire.

HERSE (SPHINX) CONVULVULI IN SCOTLAND.—I have just seen a specimen of this species, rather small but in good condition, taken by Mrs. Douglas Mackay in a garden at Aberfeldy, Perthshire, on September 6th.—W. BOWATER; Highfield Road, Edgbaston, Birmingham.

HERSE (SPHINX) CONVULVULI IN AYRSHIRE.—On September 5th, 1922, I found a specimen of this moth lying on its back on the road, alive but headless.—IAIN D. JEX LONG; 46, Eglinton Road, Ardrossan, Ayrshire.

CATOCALA FRAXINI IN EAST KENT.—On Sunday, September 17th, whilst visiting the "sugared" leaves of lime for *Cirrhia citrargo*, I was astonished to find *Catocala fraxini* on a leaf. The insect was taken at Stowting, about six miles from Hythe, and, judging from its perfect condition, seems to be a locally hatched specimen.—C. A. W. DUFFIELD; Pickersdene, Brook, near Ashford, Kent.

STERRHA SACRARIA IN DEVON.—A perfect male specimen of this interesting migrant was taken on August 7th at Efford Fort, Plymouth, about 6.30 p.m. The insect was actually disturbed by my son, Howell Peach (aged 9), who saw it fly into a tuft of grass and called my attention to it. The oblique bar is pink.—A. H. PEACH; 48, Whiteford Road, Mannamead, Plymouth.

[A similarly pink-banded male was taken by Dr. W. D. Lang this year on May 31st at Stonebarrow Cliff, Charmouth, and presented to the Natural History Museum.—N. D. R.]

EUPITHECIA TRISIGNARIA IN DERBYSHIRE AND NOTES FROM N. STAFFS.—I have much pleasure in recording the capture, on May 27th, of a female *Eupithecia trisignaria* in a wood near Ellestone,

which is only about 100 yards over the Derbyshire border, the insect never having been taken in North Staffordshire before. The nearest recorded captures are Market Drayton and Repton. Could any reader of the Entomologist tell me if the following variety of *Euchloë cardamines* has been named. In all cases but one that I have seen the insect is of typical size and has the ordinary markings, but, in addition, a distinct black spot on each hind wing. The exception, however, is a ♀ of the *hesperidis* form, which is absolutely ordinary with the exception of very heavy basal spots on the fore wings and the same curious black spots on the hind wings. This is certainly no fresh occurrence, as the following dates of occurrence indicate: ♀ *f. hesperidis*, Denstone, June 4th, 1922; ♀, Denstone, during May, 1922; ♂, Dovedale, by Mr. T. Smith, during June, 1920. Also there is one ♀ in the Daltry Collection without data. I should be interested to hear if other specimens of this variety have been taken. The extraordinary large number of *Pieris napi* of the *sabellicae* form that have been flying in this district this year also is worthy of record. Nearly 25 per cent. of the *P. napi* flying in May were melanic.—GUY STANTON; Denstone College, Rocester, Staffs.

A RECORD CAPTURE OF BLUES (*antea*, p. 211).—On August 29th I went to a clover field at the foot of Wolstonbury Hill (Sussex Downs) to look for *C. croceus*. At one spot in the rough grass margin of the field, covered with flowering knap-weed, thistles, ragwort, etc., and bounded by a hedge of holly, privet and whitethorn, we netted six species of blues within a few paces. They were *L. astrarche*, *icarus*, *bellargus*, *corydon*, *argiolus*, and *minima*. This, I think, goes one better than your correspondent.—(Major) J. J. JACOBS; Holmesleigh, Burgess Hill, Sussex, September 12th, 1922.

TWO GYNANDROMORPHS OF ARGYNNIS PAPHIA TAKEN IN THE NEW FOREST.—On July 18th Mr. W. S. Brocklehurst took a *paphia* with left wings male and right the typical female, and on July 24th I took one with the left wings male and the right var. *valezina*. Both were in perfect condition.—W. GIFFORD NASH; Clavering House, Bedford.

TERATOLOGICAL SPECIMEN OF CATOCALA NUPTA.—On September 3rd I took a specimen of *C. nupta* on a fence here with the left-hand under-wing of an extremely light red, merging into almost yellow in the centre, the colouring of the other wings being normal.—GEORGE C. HOLROYD; "Ganges Lodge," Oriental Road, Woking.

LABIDURA RIPARIA, PALLAS.—While spending the first two weeks of August at Bournemouth I hunted up the giant shore-earwig—*Labidura riparia*, Pallas—and was pleased to find it fairly common. Examples were to be met with under stones in the daytime, from the water's edge up to the foot of the sand cliff, and in all stages of development from nymphs $\frac{3}{8}$ in. long to full-grown adults. On the sand the young nymphs are much more difficult to see than the adults, as the markings which are dark in the adult are very faint in the young. These nymphs when exposed to the light run very swiftly away; the adults either crouch down flat on the

sand or else turn the forceps over their back in a very threatening attitude. The stones they seem to prefer to hide under are the flat ones resting upon the fine sand, and under them they often make a pit in which to rest. I generally found one under a stone, although sometimes there were two; but under a piece of lino, about 2 yards by 1 yard, that I turned over, I counted a large number of adults and nymphs. The thing that puzzled me was what they could find to feed upon; there were no plants or seaweed near where they were found, nor were there fish of any kind. The only things I found were some beetle larvæ, like wire-worms, about $\frac{1}{2}$ in. long, that live in the sand. Some earwigs that I brought home alive have eaten these larvæ very readily. They have also eaten raw beef; but they seem to like best living house-flies. These they chase and catch, using their forceps to hold their prey whilst they feed. They also use the forceps for carrying the flies about if they are disturbed while feeding. I hope to be able to keep some alive and discover at what period of the year they oviposit, and if the female is as attentive to the ova as is that of the common earwig, *Forficula auricularia*, Linn.—EDGAR E. SYMS; Wanstead, September 19th, 1922.

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology. Vol. xv, Nos. 3 and 4. Vol. xvi, Nos. 1 and 2. Liverpool: 1921 and 1922.

STUDENTS of the mosquitoes and other fly pests will find a number of papers, usually well illustrated, that will be of great interest to them, the list being too long to quote in detail. There are also in vol. xv, No. 3, a paper on Rat-flea Investigation by R. Newstead and A. M. Evans, and one on Dragonfly and other Natural Enemies of *Stegomyia calopus*, Meigen, by C. J. Young. W. J. L.

The Scottish Naturalist.

IN recent numbers entomologists will find notes on the Stinging of *Ophion luteus*, pp. 17 and 93; the conclusion of Notes on *Aphides* from Sutherland, by Dr. D. J. Jackson, nicely illustrated, pp. 85-92; and short notes and observations on pp. 27, 28, and 93. W. J. L.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, June 7th, 1922.—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.—The President announced the death of Mr. H. Rowland-Brown, M.A., formerly Secretary of the Society, and a vote of condolence was passed with his relatives. He also announced that Mr. H. Willoughby Ellis, F.Z.S., had been co-opted on the Council in the place of the late Mr. Rowland-Brown. Donations to the Library were announced, and thanks voted to the respective donors. The following were elected Fellows of the Society: Messrs. B. A. R. Gater, B.A.,

F.R.M.S., 13, Arundel Mansions, Kelvedon Road, S.W. 6; Lionel Lacey, Churchfield, Rodborough, Stroud, Gloucester; Herbert Macé, Faircotes, Harlow, Essex; William H. Jackson, 14, Woodcote Valley Road, Purley; Miss A. B. Flower, Eastbury, Surrey Road, Bournemouth West. — *Exhibits*: Prof. Poulton made some remarks on transformational deceptive resemblance in insects arising out of the exhibits of long-horned grasshoppers made by Dr. Marshall on behalf of Mr. Uvarov at the previous meeting. Prof. Poulton also exhibited an example of *Coccinella septempunctata* as the prey of an Asilid, *Laphria flava*. He called attention to some recent observations on the "false head" of Lycenidæ in relation to the attacks of enemies; he also gave numerous interesting particulars of the bionomics, geographical races and affinities of the remarkable African butterfly, *Pseudopontia paradoxa*. — Dr. Dixey, who illustrated his remarks with a lantern-slide, discussed the venation of this butterfly. He expressed the opinion that it is more closely associated to the Pierinæ than any other subfamily, and that there are probably two geographical races of it distinguished by the venation. — Dr. Neave made some remarks on the habits and distribution of this species, and of *Leptosia medusa* and *Leuceronia pharis*, butterflies that are associated with it in some parts of Africa. — Mr. G. Talbot, on behalf of Mr. J. J. Joicey brought for exhibition some new and rare Lepidoptera from Africa, New Guinea, and the Dutch East Indies. The following papers were read: "Transformative Deceptive Resemblance in Long-horned Grasshoppers," by Mr. B. P. Uvarov; "Elateridæ of the Seychelles Expedition," by M. Fleutiaux, communicated by Dr. H. Scott. — S. A. NEAVE, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *July 13th, 1922.* — Mr. E. J. Bunnett, F.E.S., President, in the Chair. — Major Stuart Maples, Monkswood, Huntingdon, and Messrs. H. Candler, Broad Eves, Ashstead, and E. B. Watson, Winthorpe Grange, Newark, were elected members. — Mr. R. Adkin exhibited two specimens of a dark grey form of *Grammesia trigrammica* (*trilinea*), from Abbots Wood, where the species had been unusually common at sugar. — Mr. Buckstone, living larvæ and pupæ of *Pyrameis cardui*, the ground-colour of the pupæ varying from pale grey to blackish. — Miss A. K. Loch, a uniformly pale yellow aberration of *Brenthis euphrosyne*, with quite normal spotting, from Worth, Sussex. — Mr. H. Main, several items brought by him from the South of France: (1) larvæ of the ant-lion, *Palpares libelluloides*; (2) the Tenebrionid beetle, *Pimelia gallica*; (3) cases of the large Psychid, *Acanthopsyche atra* (*opacella*), with young larvæ; (4) the spider, *Lycosa narbonensis*, discussed by Fabre; (5) the spider, *Clotho durandi*, found under stones; (6) the Myriapod, *Scutigera areneoides*, said to be poisonous; (7) larvæ of the butterfly, *Thais rumina*. — Mr. Cheeseman, living larvæ of *Attacus cynthia* and *Samia cecropia*, two large silk-spinning moths. — Mr. Enefer, the larch weevil, *Molytes germanus*, from Farningham, Kent. — H. J. TURNER, *Hon. Editor.*

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than Six Lines can be allowed for each.

Duplicates.—*A. immorata* and a few very fair *L. favicolor*; also *G. ochracea*, *X. rurea*,* *N. festiva*, *P. rubricosa*, *T. gothica*, *T. consonaria*, *S. lutealis*, *E. crocealis*, *C. lemnata*, *H. nymphaea*, and other species. **Wanted.**—*T. apiformis*, *S. ichneumoniformis*, *N. albulalis*, *Z. pyrina*, *N. Dodonea*, *D. Oo.*, *D. irregularis*, *H. chrysozona*, *H. dipsacea*, *E. venestula*, *E. expallidata*, *C. saggitata*, *R. sanguinalis*, *A. nemoralis*, *S. decrepitalis*, *B. nubilalis*, *terrealis*, *asinalis*, *E. stachydalis*, *S. sticticalis*, *O. extimalis*, *T. strativata*, *A. niveus*, and others.—*Major J. J. Jacobs, Holmesleigh, Burgess Hill, Sussex.*

Duplicates from Southern Spain.—As shown under "Exchange" in August number. A few good specimens still left.—*Major J. J. Jacobs, Holmesleigh, Burgess Hill, Sussex.*

Wanted.—Well-set Tortricidæ, especially *cristana*, *hastiana*, *literana*, and northern and western species. Liberal exchange in Macros. Would like to exchange lists.—*S. N. A. Jacobs, 5, Exbury Road, Catford Hill, S.E. 6.*

Duplicates.—*Furva*, *Tritici*, *Nigra*, *Roboraria*, *Lucerneæ*, *Porphyrea*, *Myricæ*, *Monoglypha*, *Micacea*, *Glareosa*, *Exoleta*, *Meticulosa*, *Furcula*.—*W. Milne, 115, Causeway End, Aberdeen, Scotland.*

Duplicates.—*Fuciformis*, *Gonostigma*,* *Senex* (6), *Mendica*,* *Urticæ* (4), *Crategi*,* *Connexa*, *Arbuti*, *Capsincola*,* *Festucæ* (8), *Moneta*,* *Fimbria*, *Hispidaria*,* *Lunaria*,* *Alniaria*,* *Pulveraria*,* *Hastata*, *Silaceata*,* *Decolorata*, *Abbicillata*,* *Assimillata*,* *Desiderata*.—Numerous.—*A. Simmons, 42, Loughborough Road, West Bridgford, Nottingham.*

CHANGES OF ADDRESS.—*Dr. E. A. Cockayne* from 65 to 116, Westbourne Terrace, London, W. 2.—*Mr. H. McD. Edelsten* from "Buntinghill," Balcombe Road, Haywards Heath, to "Oakhurst," Balcombe Road, Haywards Heath, Sussex.

TO CORRESPONDENTS.—All notes, papers, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, October 4th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. *Hibernia Chambers, London Bridge, S.E. 1.*—*Thursday, October 12th, at 7 p.m., Lantern Evening.* *Thursday, October 26th, at 7 p.m., Paper, "Diacrisia Mendica, its History and its Varieties."* The fiftieth anniversary of the foundation of the Society will be celebrated by a Pocket-box Exhibition and Conversazione in the Colonel's Room, Holborn Restaurant, on *Thursday, October 19th, at 6 p.m.,* followed by Supper at 8 p.m.—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEAG, The House, Albion Brewery, Whitechapel Road, E. 1.*

CONTENTS.

David Sharp, M.A., M.B., F.R.S., Etc. (1840-1922), 217. The Present Values of the Principal Works on the Palearctic Lepidoptera, *W. G. Sheldon, F.Z.S., F.E.S.*, 221. The Wing Venation of the Coniopterygidae, *C. L. Withycombe, B.Sc., F.E.S.*, 224. Trois Lépidoptères Nouveaux de la Rioja, Rép. Argentine, *Par E. Giacomelli*, 225. Observations on the Biology of Sawflies, *A. D. Peacock, M.Sc.*, 227.

NOTES AND OBSERVATIONS.—New Names for Old, *T. Bainbrigge Fletcher*, 231. Notes from the Alton District, Hants (Lep.), *E. A. C. Stowell*, 231. Notes from E. Kent (Lep.), *H. G. Gomm*, 233. *Colias croceus* and other Lepidoptera in Cumberland, *Harold D. Ford*, 233. *Colias croceus*, etc., in Derbyshire, *A. W. Richards*, 234. *Colias croceus* in Northumberland, *George Bolam*, 234. *Colias croceus* in Hunts, (*Rev.*) *Gilbert H. Raynor*, 234. *Colias croceus* in Hants, (*Rev.*) *J. E. Tarbat*, 235. *Polygonia c-album*, etc., in Berkshire, *Morris Boorne*, 235. *Polygonia c-album* in Herts, *R. B. Benson*, 235. *Thanaos tages*: Second Brood, *Fredk. J. Killington*, 235. *Manduca atropos* in Bucks, *J. A. Brown*, 235. *Hyloicus pinastri* in Suffolk, *M. Maclaggart*, 236. *Herse (Sphinx) convolvuli* at Eastbourne, *Robert Adkin*, 236. *Herse convolvuli* in London, *J. H. Vickers*, 236. *Herse (Sphinx) convolvuli* in Cambridgeshire, *A. Harold Ruston*, 237. *Herse (Sphinx) convolvuli* in Scotland, *W. Bowater*, 237. *Herse (Sphinx) convolvuli* in Ayrshire, *Iain D. Jex Long*, 237. *Catocala fraxini* in East Kent, *C. A. W. Duffield*, 237. *Sterrhia sacraria* in Devon, *A. H. Peach*, 237. *Eupithecia trisignaria* in Derbyshire and Notes from N. Staffs, *Guy Stanton*, 237. A Record Capture of Blues, (*Major*) *J. J. Jacobs*, 238. Two Gynandromorphs of *Argynnis paphia* taken in the New Forest, *W. Gifford Nash*, 238. Teratological Specimen of *Catocala nupta*, *George C. Holroyd*, 238. *Labidura riparia*, Pallas, *Edgar E. Syme*, 238.

RECENT LITERATURE.—Annals of Tropical Medicine and Parasitology, 239. The Scottish Naturalist, 239.

SOCIETIES.—The Entomological Society of London, 239. The South London Entomological and Natural History Society, 240.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (January out of print), 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1912, Vol. 45) at 15s. each; 1915 and 1916 at 10s. 6d.; 1917, 15s.; 1919, 19s. 6d.; 1920, 25s.; 1921, 25s. Carriage extra.

G. A. BENTALL, *Naturalist,*

392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

Palæarctic, Indo-Australian, African. American Lepidoptera and other Insect Orders. Apparatus and Books.

Vol. LV.]

NOVEMBER, 1922.

[No. 714.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U. CLAUDE MORLEY, F.E.S., F.Z.S.

C. J. GAHAN, D.Sc., M.A., F.E.S. N. D. RILEY, F.E.S., F.Z.S.

W. G. SHELDON, F.E.S., F.Z.S.

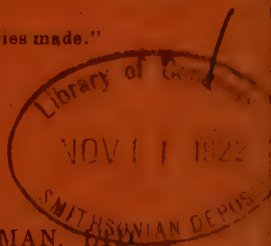
"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.



WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

ADDITIONAL PREMISES.

W. F. H. ROSENBERG begs to announce that he has opened
a NEW BRANCH ESTABLISHMENT at

25, CROMWELL PLACE, SOUTH KENSINGTON, S.W. 7

(opposite the Natural History Museum).

Telephone: Western 6776.

FOR THE SUPPLY OF

Entomological and other Natural History Requisites, Cabinets, Specimens and Books.

CATALOGUES POST FREE ON APPLICATION.

Head Office and Museum as heretofore at **57, HAVERSTOCK HILL, N.W. 3.**

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

THE ENTOMOLOGIST.

Vol. LV.]

NOVEMBER, 1922.

[No. 714

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 223.)

Works Published in England.

Albin, E. Natural History of English Insects; illustrated by 100 hand-coloured plates and 100 leaves of Text (1720); priced at about 30s.

Barrett, C. G. Lepidoptera of the British Isles; 11 vols.; 504 coloured plates (1893–1907). This work deals with the whole of the Order up to and including the Tortrices. It has some serious defects, but is indispensable to the student. The price of issue was £34 13s. It is now catalogued at £25. There was also an edition without plates brought out at £6.

Buckler, W. Larvæ of British Butterflies and Moths; 9 vols. (1885–1899). A Ray Society publication, issued at £9 9s. Still to be obtained, I believe, from the Ray Society, at the price of issue. Copies that come into the market from time to time usually realise the same amount, or thereabouts. This is of course the standard work on the larvæ of the British species, and treats of the whole Order to the end of the Phycids. The coloured plates number 164.

Curtis, J. Illustrations and Descriptions of the Lepidoptera found in Great Britain and Ireland; 2 vols.; 193 coloured plates (1862); issued at £9 12s. 6d. This is a reproduction of the Lepidoptera of Curtis's great work British Entomology. It can usually be picked up for from £3 to £4.

Donovan, E. Natural History of British Insects; 16 vols.; 576 coloured plates (1792–1813). The price of this work varies from £6 to £9. There were reproductions issued in which the plates are very inferior, and the lower-priced copies probably refer to these.

Entomologist, The. Vols. I to LIV (1840–1921). A complete set is extremely difficult to obtain, owing to the scarcity of Vol. I (1840). Dr. Chapman's copy, which included about a dozen duplicate volumes (1887–1898), fetched £12 10s. at auction.

A complete set might be worth £10 or £11, but I have not seen one catalogued recently.

Entomologist's Annual. 20 vols. (1855–1874); usually to be obtained at from 20s. to 30s. according to binding and condition.

Entomologist's Record. Vols. 1 to 32 (1890–1921). A set is usually to be bought for £6 or £7. Dr. Chapman's sold for £5.

Entomologist's Monthly Magazine. Vols. 1 to 57 (1864–1921). Dr. Chapman's copy brought £9—probably its full value. A few years ago I required a number of volumes to complete my set. These I picked up, bound, for less than 2s. 6d. per volume.

Entomologist's Magazine. Edited by Edward Newman. 5 vols. (1832–8); quoted at £2 10s. to £3 10s.

Entomologist's Weekly Intelligencer. Edited by H. T. Stainton; 10 vols. (1856–1861). I have seen this priced as low as 18s.

A clean bound copy can usually be obtained for 30s. to 40s.

Entomological Society of London, Transactions. 69 vols. (1836–1921). A set, 1836–1906, was priced at £60; another, 1836–1920, at £75. Dr. Chapman's copy sold for £21, but that of course was a dealer's bargain. The earlier volumes are out of print, and are almost impossible to obtain otherwise than as part of a set.

Harris, Moses. The Aurelian (1778) and several subsequent inferior editions; 44 coloured plates. A good copy of the original edition sells for £4 to £5, one of the inferior subsequent editions for from £1 10s. to £3.

Harris, Moses. An Exposition of English Insects (1782); with 31 coloured plates. Several editions were issued and are to be had at from 20s. to 40s. according to condition and quality of plates.

Haworth, A. H. Lepidoptera Britannica (1828), 609 pp. An extremely scarce book, the greater part of some portions of the issue being accidentally burnt; only a few complete copies are in existence. In 1919 I wanted a copy, and a careful and prolonged inquiry eventually elicited that there were two copies it was possible to purchase. For one of those £5 5s. was asked; for the other, a much inferior copy, £8. I doubt if one now could be purchased for less than £10.

Humphreys and Westwood. British Butterflies and Moths and their Transformations. 3 vols. (1841–5), and subsequent editions with much inferior plates. The first edition is usually priced at from £4 to £5. The subsequent editions are almost useless, the plates are so inferior.

Kane, W. F. de V. European Butterflies; 1 vol.; 15 uncoloured plates (1885). Admirable in every way, and absolutely essential to all collectors and students of this branch of the subject. Out of print, but can often be had second-hand for 10s. to 12s.

- Lang, H. C. *The Butterflies of Europe Described and Figured*; 2 vols.; 395 pp.; 82 coloured plates (1884). As essential as the last; published at £3 18s. To be purchased at from £2 10s. to £3.
- Leech, J. H. *British Pyralides*; 121 pages of letterpress and 18 plates (1886); with coloured and uncoloured plates. The former is rare and costs from 20s. to 30s. The latter can be had for 7s. 6d.
- Lewin, W. *Insects (Lepidoptera) of Great Britain*; with 46 coloured plates (1795); £1 to £1 10s.
- Meyrick, E. *Handbook of British Lepidoptera* (1895). Essential to all British lepidopterists. There are plenty of second-hand copies in the market at about 3s. 6d. per copy.
- Newman, E. *Illustrated Natural History of British Moths*; 1 vol. (1869); and *Natural History of British Butterflies*; 1 vol. (1871). These books, valued and invaluable in their day, can now be obtained for about 2s. 6d. per volume.
- Petiver, James. This author wrote a number of pamphlets on various natural history subjects in the early eighteenth century; amongst them was one on the Rhopalocera with 5 coloured plates published in 1717. These are probably the earliest figures of British Lepidoptera. The work is scarce, and I have never seen it offered, but I know of two copies which cost their respective owners approximately £5 and £12.
- Pierce, F. N. *Genitalia of the Noctuidæ of the British Islands*; 1 vol. with 32 plates (1909).
- Pierce, F. N. *Genitalia of the Geometridæ of the British Islands*; with 48 plates (1914). These two volumes are indispensable to students, and can still be obtained from the author. They were issued at 7s. 6d. per volume.
- South, R. *Butterflies and Moths of the British Isles*; 3 vols. (1906-08). Published at 21s. One of the most practical popular works on British Lepidoptera ever issued. Known and appreciated by all students.
- Stainton, H. T. *Manual of British Butterflies and Moths*; 2 vols. (1857-9). To be purchased for a few shillings, the price depending upon binding and condition.
- Stainton, H. T. *Natural History of the Tineina*; 13 vols.; 80 coloured plates (1855-73). Text in four languages. Infinitely the best work ever published on this group. Issued at £8; can be obtained at present for from £3 to £3 10s.
- Stephens, J. F. *Illustrations of British Insects*; 12 vols. (1828-46); 100 coloured plates. Was issued at £21. Can now be purchased for from £4 to £5.
- Stephens, J. F. *Systematic Catalogue of British Insects* (1829). Published at 27s.; to be purchased now for about 5s.

- Tutt, J. W. British Lepidoptera ; 9 vols. (1889-1914). Tutt's "*magnum opus*." It is absolutely necessary to all students. It was issued at £9, and is now to be purchased for about £4.
- Tutt, J. W. The British Noctuæ and their Varieties ; 4 vols. (1891-2). Published at £1 8s. ; now catalogued at £1 2s. to £1 5s.
- Wheeler, The Rev. G. The Butterflies of Switzerland and the Alps of Central Europe (1900). Admirable and indispensable to all collectors and students of European Rhopalocera. Published at 5s. per copy, or 6s. interleaved. Still to be obtained, I believe, from the author.
- Wilkinson, S. J. British Tortrices ; 1 vol. ; 4 uncoloured plates ; published at 18s., priced now at 15s. My copy, purchased in 1917, cost 7s. 6d. The price has appreciated of late years.
- Wilkes, B. English Moths and Butterflies ; 120 coloured plates (1747-60) ; published at £9 9s. Several subsequent and inferior editions. The present cost of the original edition is £3 to £4 according to condition and binding.
- Wood, W. Index Entomologicus (1839) ; 54 coloured plates (1944 figures). An extremely useful work from several points of view, but especially because Wood figured Stephens's types of species and forms named by the latter. A copy is priced at 45s. The Westwood edition (1854) has much inferior plates, but it contains a useful supplement. It is valued at the same price as the original edition. There is another inferior edition dated 1845, which is priced at 30s.
- Zoologist, The. This magazine, between the years 1841-63, contained a large amount of entomological matter. A year or two ago I saw, too late, a copy of these volumes priced at 1s. per volume. This is the only occasion that I have noticed them catalogued.
- Zoological Record (1864-1920) ; 57 vols. Published annually by the Zoological Society. Gives references of everything of any importance that is written within the year in every department of zoology. This work is, of course, essential to every advanced student. Unfortunately its bulk prevents most private libraries affording it shelf room. It is published at 30s. per volume, and is usually catalogued second-hand at from 6s. to 10s. per volume.

(To be continued.)

ERRATA.—P. 198, line 19, for 47° read 37° ; p. 199, line 33, for *clots* read *dots* ; p. 221, line 33, for original *plates* read original *drawings*.

HENRI FABRE AND THE MICROGASTER.

BY REV. G. W. CRUTCHLEY.

SURELY Fabre, that "incomparable observer," cannot err in his notes on the *Microgaster*, yet I am puzzled to account for what I have seen of its activities. Fabre tells us that these flies do not attack the larvæ of *Pieris brassicae*, but that they deposit their eggs in the eggs of the butterfly. He enclosed *Microgaster glomeratus* with the larvæ of *Pieris brassicae* without result. But as soon as he substituted eggs for caterpillars the flies eagerly used their ovipositors and laid their eggs inside the eggs of the butterfly. The larvæ of *Pieris brassicae* emerged from the eggs, and developed without any apparent inconvenience from the parasites which hatched out within their tissues. When the larva of *Pieris* was about to pupate the larvæ of *Microgaster* issued from one of the spiracles and formed the familiar yellow silk cocoon, in which they pass the pupa stage of their development.

Gathering the eggs of *Pieris brassicae* I kept them until the larvæ appeared, then fed them until they had moulted four times. Then I placed them on a cabbage which was growing in a convenient position for observation and visited them every day. One day I noticed a great deal of agitation amongst the caterpillars. They had left off feeding, and every five or six seconds the upper half of their bodies was jerked violently back. This action was continuous, always with the pause of five or six seconds, then simultaneously all the larvæ would throw back their heads as by a common impulse. They were gathered in groups of from six to eight, though there were a few solitary ones. I sat and watched them with the aid of a glass for over an hour and was well rewarded for my pains.

Presently I saw *Microgaster* flies coming singly and settling on the cabbage, while I noticed others climbing painfully up from the centre of the plant. As I watched a *Microgaster* fly alighted near the head of a caterpillar that was quieter than the others. She approached warily and appeared to touch and soothe the larva with her antennæ. Suddenly she sprang on the back of the caterpillar and it immediately swung its head round and apparently bit the fly, though I found out afterwards that in this I was mistaken. The *Microgaster* was tumbled down into the cabbage and afterwards I saw it climbing back slowly and with difficulty. I watched another fly very busily cleaning its antennæ, legs, wings and abdomen for a long time, and I wondered why. I also noticed a green fluid on the surface of the cabbage leaves. Single flies continued to arrive and others were still struggling out of the centre of the cabbage. The one which had been so long at its toilet flew away as though glad to be gone. Several others attacked the caterpillars, always in the same way and with the same result. It was a certain

prelude to a journey into the interior of the cabbage. Immediately the caterpillar felt the prick of the ovipositor the fly was flung off, but in one instance, probably through the weariness of the larva, the fly was in position three seconds before it was thrown off. But it was not clear what was the nature of the defence which the larvæ had against the fly.

After about three-quarters of an hour the caterpillars grew hungry and three or four of them climbed up to the edge of the leaf and began to feed ravenously. Presently a *Microgaster* appeared on the opposite side of the leaf and slowly approached. I watched through my glass and saw the mode of attack and the nature of the larva's defence. The caterpillar, conscious of danger, ceased feeding, and the fly crept up until she had reached a position with one leg on each side of the caterpillar's head and gently waved her antennæ. With a sudden spring she was on its back and instantly the heads of the four larvæ were turned towards the fly, while their movements were so rapid that I could not follow them. It was like watching a cat set on by four dogs. In about three seconds the fly was thrown off and was dragging its body and struggling along the leaf. I examined it through the glass and found it was completely drenched in green liquid, which fastened the wings to the body and stuck the legs together so that they were useless and dragged behind. The liquid was so abundant that wherever the fly went she left a trail of it behind her. Now she began the same industrious toilet which I had seen the others perform, and when cleansed seemed glad to escape and fly away.

If the *Microgaster* lays her eggs only inside the eggs of *Pieris brassicae* what were these flies doing, and why this careful stalking and fierce persistent attacks in spite of the unsavoury green liquid with which they were drenched? The fear of the larvæ as shown by the jerking of their heads in unison and their refraining from food proves that it is a recognised danger, the knowledge of which must have come down to them through many generations.

We had a plague of *Pieris* in West Cornwall which stripped the cabbage and turnip fields, and so numerous were the larvæ that it was impossible to put the foot down without crushing them. Nature provided the only effective remedy and the *Microgaster* cocoons were everywhere. They could be found on nearly every flowering stem of thrift and plants of like character, and at Gwinnear Road Station, where there is a wall about three hundred yards long, the wall was covered with them. Selecting a space covering one square yard of the wall I counted 100 cocoons, each of which contained from fifty to two hundred chrysalids. The entire space of the wall was covered in like manner.

Porthleven,
Helston,
Cornwall.

MOSQUITO DIAGNOSIS: A SUGGESTION TO DESCRIBE WING-SPOTS, FORK-CELLS AND PALP-MARKINGS BY MEANS OF WRITTEN FORMULÆ.

BY GILBERT E. BROOKE, M.A.Cantab., L.R.C.P.Edin., D.P.H.,
Chief Health Officer, S.S. Medical Dept.

IN describing a mosquito for a book or paper nearly every detail can be adequately set forth in words without the aid of diagrams or photographs. The various shapes of scales are now well recognised and need only be referred to in zoological parlance. The mosquito can be measured and its actual size given. The position, colour and size of abdominal or leg-banding can be expressed in words without ambiguity.

There are three details, however, which it has been almost impossible up to the present to express in words, and recourse to diagrammatic sketches or photographic reproduction has usually been found necessary. I refer to (a) anopheline wing-spots; (b) the relative length of the first submarginal and second posterior fork-cells in culicine wings; and (c) to the size and position of anopheline palpar banding. In working out diagnostic tables for the use of my department, I felt that if these details could be reduced to writing it would mean not only the saving of much expense in the reproduction of illustrations, but also greater scientific accuracy. Hence the formulæ presently to be described, which are now published in the hope that they will prove useful to entomologists.

WING-SPOTS.

For all practical diagnostic purposes, with regard to wing-spots, we are only concerned with those which occur on the costal, the subcostal and the first longitudinal veins. These may be black spots in a dominantly light wing, or white spots in a dominantly dark wing.

The wing formula is arrived at in the following way: The costa, from a basal point opposite to the axillary notch, as far as its junction with the first longitudinal vein, is arbitrarily divided into 25 equal parts. To each of these parts a letter of the alphabet (omitting "i") is assigned, beginning from the basal point. If *black* spots are being described we begin the formula with "B = so and so"; if *white* spots are being described, we begin with "W = so and so." The costal spots are described first, each spot being designated by the alphabetical letter or letters of the one or more sections which it occupies. A cæsura is used to punctuate the spots, and the conclusion of the costal part of the formula is marked by a double cæsura. The formula then proceeds with the literal designation of the spots on the subcostal vein, similarly

concluded with a double cæsura. Finally the spots on the first longitudinal vein are exemplified.

It may sound a little complicated, but the absolute simplicity of it will be seen by the following diagram of the wing-spots of *maculatus*, and the formula which follows it. A long spot occupying, say, five divisions, at l, m, n, o, p , can be shortened by calling it l^5 , which shows at once its position and length. Sometimes a spot may be only one division in length, while it actually occupies half of one scale division and half of another; such we designate by, say, $|\frac{t+u}{2}|$. Sometimes a spot occupies a little

more than one scale division; such can be shown by, say, $|n+|$.

The objection has been made to me that it is very hard in practice

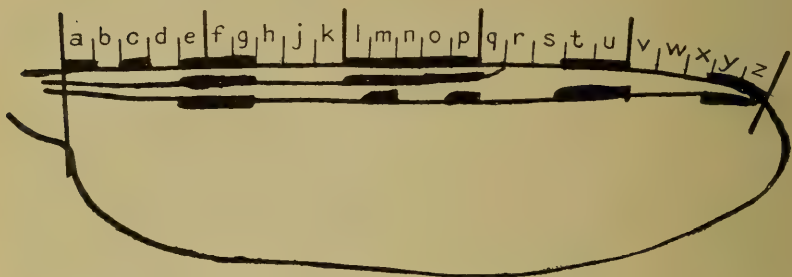


FIG. 1.—Wing of *Anopheles maculatus*.
Formula: $B = a/c/e^3/l^5/t^2/y^2||e^3/l^5||e^3/m/p|t^2/y^2||$.

to divide up the costa by observation and to assign spots to the definite divisions. This is much simpler than it seems, for all that is necessary is to draw the wing and spots with a “drawing-eye-piece,” and then approximate a scale to the drawing and write down the formula.

The following are the wing formulæ of some of our Malayan anophelines:

elegans $B = a^2/d^2/g^3/l^6/s^4/x^2||g^3/l^3/q||d^2/g^3/l/n^4/s/u^2/x^2||$.

umbrosus $W = o/y||nil||y||$.

barbirostris $W = q/y^2||g||\frac{c}{2}/\frac{d}{2}/f^2/q/z||$.

fuliginosus $W = d/g^2/o^2/u^2/z||g^2/o^2||c^2/g^2/k/n/u^2/z||$.

ludlowi $B = a^2/d/f^2/l^5/t^3/y^2||f^2/l^5||b/f^2/l/n+|t^3/y^2||$.

karwari $B = a/c/e^3/l^6/t^3/y^2||e^3/l^6||a/c/e^3/l/n^2/q/t^3/y^2||$.

FORK-CELLS.

We frequently find such very indefinite descriptions as “the first submarginal cell is a little narrower and much longer than the

second posterior cell"; or "the base of the first submarginal cell is almost level with that of the second posterior."

I therefore suggest that a line be drawn through the angles of the two cells in question and produced to cross the costa. The basal angle which this line makes with the costa can be used as a **critical angle** for the fork-cells of each species. The size of the angle can be quite reasonably gauged by mere observation, or can be accurately measured from a *camera lucida* drawing or microphotograph.

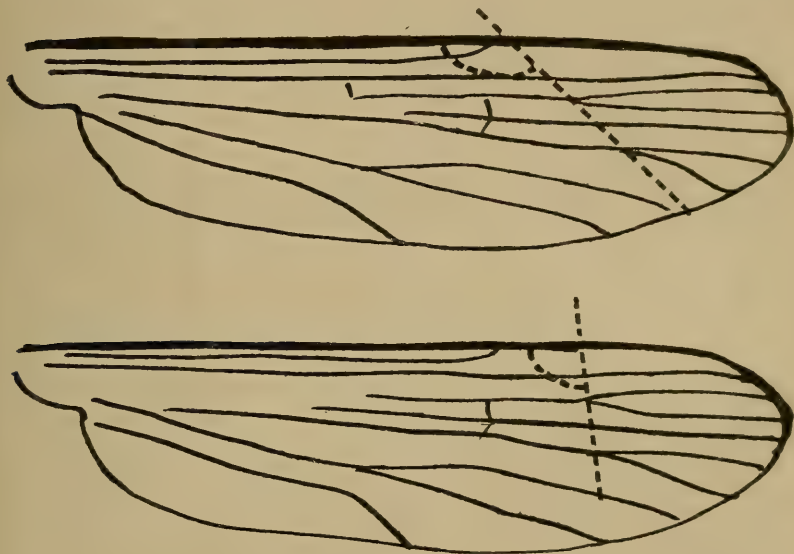


FIG. 2.—Critical angles for fork-cells.

PALPS.

The position and size of bands of anopheline palps or culicine probosces are of diagnostic importance. Diagrammatic representations are frequently misleading. I suggest therefore that a definite numerical palp formula be assigned to each anopheline.

The idea is, always to divide the palp into 24 imaginary divisions. The relative proportions of dark or light segments are expressed by a simple sequence of numbers beginning from the base of the palp, dark sections being shown by ordinary numerals and light-coloured sections by italic numerals. The number, size and position of the bands is thus seen at a glance, and palps of different species can be compared without the expense of reproduced drawings and without the indefiniteness of a written description.

The following are the **palp formulæ** for some of our Malayan anophelines :

kochii = 5 1 4 1 4 1 4 1 3.

elegans = 7 2 6 1 2 1 1 4.

umbrosus = 24.

barbirostris = 24.

fuliginosus = 7 1 8 1 4 3.

maculatus = 8 1 7* 3 1 4.

rossi = 8 1 7 1 3 4.

ludlowi = 9 1 8 1 2 3.

karwari = 7 2 6 2 1 3 1 2.

* A faint yellow band is often found in the middle of this dark section.

May 28th, 1921.

SOME UNDESCRIBED RHOPALOCERA IN THE BRITISH MUSEUM (NAT. HIST.) II.

BY N. D. RILEY.

LYCÆNIDÆ.

Pseudaletis spolia, sp. nov.

♂. *Upperside, both wings*: Black with lemon-yellow markings. *Fore wing*: The yellow markings consist of a subquadrate spot in cell slightly before the discocellulars, not extending quite across the cell, and a broad irregular subapical bar from slightly beyond middle of costa to rather below the middle of hind margin, but not reaching either by some 2 mm. *Hind wing*: On the hind wing there is a single large conical yellow patch extending from the base towards hind margin, which its apex, in area 2, very nearly reaches, but not extending towards inner margin beyond vein 2. Three silver spots marginally in areas 1b and 1c. *Underside, both wings*: Greyer, the markings of upper side repeated and rather larger, the yellow slightly paler. *Fore wing*: An indistinct, slightly paler narrow antemarginal fascia, more marked anteriorly, and another, similar, from costa between the subapical bar and the antemarginal fascia, curving outwards to join the antemarginal fascia in area 3. A short diffuse oval white patch centrally at the base of area 1b. *Hind wing*: The central yellow area much more sharply defined and reaching nearer the margin. Between it and the hind margin run two pale narrow bands, the outer curved and forming a white spot on vein 5, the inner straight. The area between vein 2 and inner margin is densely covered distally and posteriorly with bright ochraceous scales through which run two silvery bands, both black-edged, the proximal by far the longer and broader; neither quite reaches vein 1b. Internal to each of the three silver spots in areas 1b and 1c is a larger jet-black spot.

♀. *Upperside, both wings*: The lemon-yellow markings enormously

increased in extent, in the *fore wing* reducing the black markings to a narrowish band extending from base along costa and hind margin into the extremity of area 1a, its inner edge very irregular throughout, forming a broad tapering bar across the discocellulars, which fuses with a triangular patch in the base of area 2, and a broad black subapical bar enclosing an oval patch of yellow. The base of the wing as far as the origin of vein 2 is suffused with pale orange. In the *hind wing* the whole wing is lemon-yellow with the exception of a narrow black border which extends as far as the anal lobe, where it encloses the three silver spots, which are a good deal larger than in the male. *Underside, fore wing*: As above, except that there is no basal orange suffusion; the cell is filled with black to a little beyond the origin of vein 2, so that a yellow oblong spot is thus enclosed in the cell; and that the band on the hind margin is narrower than above, the difference in the corresponding widths being occupied, in the apical area only, by white. *Hind wing*: Marginal band also narrower than above, inwardly edged with white, terminating half-way along costa with a wedge-shaped black mark directed towards the extremity of vein 3, but barely reaching vein 7. A narrow irregular black mark extends from base some slight distance along vein 1b, and beyond this is a series of three rather indefinite black points in a curve, the uppermost on vein 3 at its origin, the others one each on veins 2 and 1b. The orange scaling of the male in the abdominal region is represented only distally and faintly along vein 1b; of the two silver bands of the male only the outer is present, and extends as far as vein 2.

The abdomen, thorax and palpi in both sexes orange below; in the male black like the wings above, slightly banded with yellow laterally, in the female the head and thorax above are dark brown, the abdomen conspicuously yellow banded laterally and dorsally, and the thick tuft of hairs at the extremity of the abdomen grey.

Length of fore wing, ♂, 23 mm.; ♀, 27 mm.

B.M. Type No. Rh. 194 ♂, 195 ♀, Buar, Cameroons, May, 1914.

The male agrees very well with Holland's figure of his *nigra* (Ent. News, iv, pl. 1, fig. 9) and also with his description (Annals and Mag. [6], x, p. 286) except as to colour. All the markings here described as yellow appear to be white in *nigra*. Similarly the female would do very well for *antimachus*. Staud., were it white instead of yellow. The probability seems to be that *antimachus nigra* and *spolia* will all prove to be forms of the same species.

Pseudaletis dardanella, sp. nov.

♀. *Upperside, both wings*: Dead white, the hind margins and cilia black. *Fore wing*: The costal area to just beyond end of cell, the base of wing as far as the origin of vein 2, and the discocellulars, all orange. The whole of the apical area black, the marginal band decidedly broad, black, the inner edge of the continuous black area thus formed very irregular and diffuse. Some slight orange suffusion is also present against the marginal border on vein 1 and centrally

in area 1a. *Hind wing*: The black marginal border commences just above vein 7, is broadest on vein 6, and from there gradually narrows to just beyond vein 2, where it again expands and encloses three largish silvery marginal spots; it is here internally bordered by a slight orange suffusion.

Underside, both wings: White. *Fore wing*: Marginal border on costa is about 5 mm. wide and rapidly tapers to a narrow line posteriorly. The costal area is uniformly black, to within about 1 mm. of the marginal border, from which it is separated by a curved tongue of the white ground-colour, and extends posteriorly in four broad projections, of which the first occupies the base of the cell and is barely separated from the second, which is directed towards the origin of vein 2, but ends bluntly about halfway across cell; the third forms a broad mark along the discocellulars, ending abruptly at the origin of vein 3, and the fourth, by far the largest, extends to the middle of area 3. The extreme base of area 2 is filled with black, and there is a trace of an orange band against the marginal border in area 1b. *Hind wing*: The marginal border very much narrower than above, reduced to a mere anteciliary line posteriorly; a largish black mark at the extremity of vein 8, slightly outwardly directed, and a black dash along the base of vein 1a. Silver marginal spots as above, inwardly surmounted by black dots, the surrounding area orange, crossed near its inner edge by a very indistinct silver band, and extending marginally as far as vein 4.

Head and thorax, above and below, orange. Abdomen banded with white and grey, anal tuft grey. Antennæ dark brown.

Length of fore wing 27 mm.

B.M. Type No. Rh. 196 ♀: Cameroons, Crowley Bequest.

Looks at first sight like *Ps. antimachus*, Staud., but can readily be separated from that species by the absence of the white apical area on the fore wing above and by the very different arrangement of the black markings of the underside of the same wing. It undoubtedly belongs to that section of the genus.

B. M. (N. H.),
S. Kensington;
March, 1922.

RECORDS FROM A SOUTH HAMPSHIRE LEPIDOPTERIST'S LOG-BOOK FOR 1920.

By A. T. POSTANS.

THE following records are taken practically entire from my original diary for the season 1920, the only omissions being names of locality and detail of a minor nature. Further, I would add that these records are a portraiture of field work accomplished in spite of the handicap of living in the centre of a large town, with the addition of a sixty-five-hour working week fifty-two weeks of the year.

The winter 1919-1920 will long be remembered as one of the mildest on record—at least by people in the south of England. Countless larvæ, etc., must have been tempted early from their hibernation. In my own small garden sallow was in bloom on January 16th, and at dusk on the same date I found larvæ of *Nania typica*, *Phlogophora meticulosa* and *Arctia caja* feeding on hollyhock and the young shoots of honeysuckle. On February 7th *Xylocampa areola* appeared in my outdoor cage and several were bred during the following days. The 8th was extremely mild and cloudy, and during the forenoon I cycled to the woods to search palings and tree-trunks for imagines of *Hybernia leucophaearia*, etc., but I saw not a single insect of any sort. During the evening of the 13th I found many larvæ of *N. typica*, and a few *T. pronuba* and *Eurois prasina* feeding in the garden. The 15th was another mild day, and during the forenoon I was in the woods to search palings, etc., and I observed about two dozen males of *H. leucophaearia* at rest, but saw nothing else. On the 29th in the same locality, although the weather was still mild and calm I only noted two male *H. leucophaearia* after much searching. Of *Phigalia pendaria* or *Apocheima hispidaria* I had not as yet seen a sign, although these two species are usually abundant here.

March 21st was an ideal spring day, being beautifully bright and warm. I went to the woods in the forenoon and saw many *Brephos parthenias* flying round sallow bloom, and odd specimens of *Vanessa io* and *G. rhamni*; a long search of tree-trunks only revealed a solitary *X. areola*. *H. leucophaearia*, etc., were now apparently quite over as I did not observe any either on this date or later. On March 22nd *Aleucis pictaria* was bred and also during the following days. They were from wild larvæ I had collected the previous summer. March 24th was somewhat cloudy after three or four bright days, and I determined to visit sallow bloom, which was fast going over owing to the exceptionally mild winter. So having observed a likely clump on the previous Sunday I visited it in the evening at dusk. There were very few insects about, however, chiefly *O. vaccinii* and *E. satellitia* and one or two each of *T. pulverulenta*, *T. miniosa*, *T. munda*, *T. incerta*, *X. areola*, etc., and I netted a couple of *E. abbreviata*. Rain commenced to fall about midnight and I arrived home somewhat damp. On the 26th I noticed a newly emerged *Pieris rapae*, drying its wings in the garden. The 28th was a mild spring day, calm in the evening, with a half moon behind a film of light cloud. I visited the shallows again, and observed all the species noted on the 24th with the addition of *T. gracilis* and *T. gothica*. That usual pest *T. stabilis* seemed quite scarce. My net gave me a couple each of *E. abbreviata* and *Lobophora carpinata*, while *E. pumilata* was flying in some numbers about gorse by the road-side. On the 30th *Anticlea nigrofasciaria* was bred.

On April 4th saw imagines of *E. albipunctata* appearing in my cages. They were from wild larvæ collected the previous autumn. On the 17th *Hydriomena ruberata* was bred. The 21st was bright and warm during the day and in the afternoon I found larvæ of *Arctia villica* and *A. caja*, commonly, in bedstraw clumps growing on a sunny bank bordering a main road outside Portsmouth. Ova of *Lycia (Biston) hirtaria* hatched on the 23rd. On the 25th I found larvæ of *Parasemia plantaginis* swarming on the downs a few miles outside the town. Quite 50 per cent. of these larvæ subsequently fell victim to a fungoid disease that invariably manifests itself after an unusually wet winter. During the afternoon of the 28th I obtained more larvæ of *A. villica* in the lanes and I saw many half-grown larvæ of *Odonestis potatoria* on the rank grass.

On May 5th *Ephyra pendularia* was bred and larvæ of *A. villica* commenced to spin up for pupation. The 12th was sunny with a rough wind from the S.W. I went to the woods in the forenoon, and beat much birch, chiefly to obtain larvæ of *G. papilionaria*, but I failed to find even one. Indeed all larvæ seemed to be remarkably scarce, and remained so throughout the spring, the oaks in particular showing none of the usual devastation by *Tortrix viridana*. Imagines of *Venilia macularia* were just making their appearance, and I saw a couple of *Vanessa io*, but observed little else. The 16th was a warm, calm, sunny day, and I cycled to some woods fifteen miles out. Much searching of beech trunks revealed solitary examples only of *Tephrosia consonaria* and *T. punctularia*, which species usually abound here. Imagines of *Hesperia malvae* and *Misoniades tages* were evidently just coming out, as I saw a few fresh specimens of each in addition to numerous *G. rhamni* and *Vanessa io*, etc. One side of the wood comes out at the top of some downs, and here I found *Callophrys rubi* in superb condition flying and sitting in abundance over and on beech foliage. Here also were numerous *Ematurga atomaria* flying over heather, and I netted a few *Eulype hastata* and two female *S. mendica* flying in the sunshine. Beating produced *Bapta bimaculata*, *B. taminata* and *Cidaria corylata*, etc.

(To be continued.)

NOTES AND OBSERVATIONS.

NOTE ON SYNONYMY OF TWO MICRO-LEPIDOPTERA FROM BRITISH COLUMBIA.—Through the kindness of Mr. E. H. Blackmore I lately received some named species of micro-lepidoptera from British Columbia, of which two call for comment.

(1) *Depressaria blackmori* Busck is a later synonym of *D. dryadoxena*, Meyr., but the fine bred examples now sent show that the species to which these names apply is unquestionably the European *costosa* Haw. These examples, bred from *Genista*, agree exactly in

the minutest details with a series bred by myself from *Genista* at Cambridge. The occurrence of this and some other European species (as *Carcina quercana*) in British Columbia, and not in the Atlantic States, is very interesting, and must indicate immigration by way of Siberia.

(2) *Tortricodes fragariana* Busck is by no means correctly assigned to *Tortricodes*; it is in fact a *Peronea*, with veins 3 and 4 of hind wings coincident—an unusual character, but not involving exclusion from the genus. Hence the name *fragariana* cannot stand, since there is already an earlier *Peronea fragariana*, Kearfott: I propose for the species the name *elapsa* **nom. nov.**—E. MEYRICK; Thornhanger, Marlborough, October 12th, 1922.

PROBABLE DANGER OF A NEW PEST.—I lately received from Paris for determination an example of a small dark *Tortrix* which I recognised as *Laspeyresia molesta* Busck, an insect native to Japan and China, but accidentally introduced into the United States, whence it was first described. The larva bores the fruit of the peach, and is very destructive. M. Trouvelot, who communicated the specimen, stated that it was bred at Fréjus (Var), where it appeared suddenly last year for the first time, a large proportion of the crop being damaged. I am not aware that it has been found previously in Europe. It seems to me so highly probable that this obnoxious insect will be imported into this country in fruit or otherwise (since it has already crossed both the Pacific and the Atlantic) that I think fruit-growers would be well advised to look out for it, and report at once on its discovery. The larva attacks the twigs as well as the fruit, and a description of its habits by A. L. Quaintance and W. B. Wood will be found in the Journal of Agricultural Research, vol. vii, No. 8 (1916), issued by the Department of Agriculture at Washington.—E. MEYRICK; Thornhanger, Marlborough, October 12th, 1922.

COLIAS CROCEUS IN N. WALES.—On August 19th a male of this species was taken, and two others seen at Rhyl, N. Wales.—W. BOWATER; 23, Highfield Road, Edgbaston, Birmingham.

COLIAS CROCEUS AND HERSE CONVULVULI IN SURREY.—Since reporting *croceus* at Coulsdon on August 13th, I have made several additional captures in the neighbourhood up to September 3rd. The preponderance of males is rather striking, *i.e.* 13 out of 15. The size of the specimens also seems much below the average.

On September 29th I had brought to me a fine ♀ *convulvuli* which had been captured at rest on a shed door at Old Lodge Lane, Purley. Although taken the day previously it was in almost perfect condition, which seems to point to the fact that it had emerged locally.—ARTHUR BLISS; The Cottage, Red Down Road, Coulsdon, Surrey.

HERSE CONVULVULI AND COLIAS CROCEUS AT WADHURST, SUSSEX.—On October 3rd a fine female *Herse convulvuli* was brought to me: it had been found at rest in the town. I kept her for eggs but failed to obtain any. Judging by the spring immigration of *Colias croceus*, I fully expected that 1922 would be an "*edusa* year," but so far I have taken but one specimen, a female, on September 7th. Wadhurst is under twenty miles from the coast and I was out collecting on most sunny days.—A. H. JONES; Church Gate House, Wadhurst, Sussex.

HERSE CONVULVULI AND COLIAS EDUSA AT BRIGHTON.—During the week ending September 11th a dozen *H. convolvuli* (mostly females) were taken at Brighton. Two were found by lads, two in covered buildings, and eight caught in the net hovering over the flowers of scented *Nicotina* plant at dusk. A full-fed larva of this insect also was found at Chichester in August, but unfortunately died just before pupation. During August *C. edusa* appeared in the usual localities here, but only in dozens (including two var. *helice*); probably this was due to the continued rough and wet weather we have experienced ever since the females arrived from France in early June. As to the recent attempt to change the name of this insect, I am content to call it "*edusa*" as it has been known by that name for the last 150 years. Similarly, it may be, we shall soon be hearing that Wellington's great battle on June 18th, 1815, will in future be called the "Battle of Planchmoit," as it took place one hundred yards nearer to this Belgian village than to Waterloo.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

[No attempt to change the name of *C. croceus* has been or is being made; it is merely being sought to depose the usurper *edusa* in favour of the rightful name *croceus*. The (wrongful) employment of the name *edusa*, even for 150 years, cannot surely justify the perpetuation of the error. Besides, what is 150 years after all? Are there not many more such periods to come? Is it so very difficult to put up with a little inconvenience now if by so doing we may very greatly benefit future generations of entomologists?—N. D. R.]

HERSE CONVULVULI IN HANTS AND THE SCILLY ISLES.—Three specimens of this Hawk Moth have been brought me within the last six weeks, two being male and the last a female. All were in good condition. The first and third specimens were taken at rest within 100 yards of one another. I have just heard from a non-entomological friend that while staying lately in the Scilly Isles no less than ten specimens flew in, on different nights, to a conservatory.—(Rev.) J. E. TARBAT; Fareham, October 13th, 1922.

HERSE CONVULVULI AT CHICHESTER.—Several specimens of this moth have occurred here during the last week of August and the first of September. No less than four were caught on successive evenings, and brought indoors by a cat. It is somewhat singular that this moth so often falls a victim to *Felis catus* (*domesticus*); but the explanation probably is that the moth is mistaken for a bird. The first which I saw was on August 29th.—JOSEPH ANDERSON; Alre Villa, Chichester, Sussex.

HERSE CONVULVULI IN THE ISLE OF WIGHT.—On September 8th Mr. George E. Norrish caught a fine male *Herse convolvuli* resting on the heading of the side door of his shop in High Street, Ventnor. He has kindly given the moth to me.—H. H. L. SCOTT; Woodcliffe, St. Lawrence, Isle of Wight.

POLYGONIA C-ALBUM, ETC., IN BUCKS.—On September 2nd I saw a specimen of *P. c-album* at Monks Risborough, Bucks, and two others have been seen in the district. I am glad to say *Agriades corydon* was present in larger numbers this year and fresh specimens

could be seen in mid-September. I took a specimen of *A. bellargus* with a blue spot on the underside, also one *semi-obsolata*, but aberrations were scarce in both *bellargus* and *corydon*. Out of a batch of 12 *C. croceus* larvæ seven produced females, of which two were of the *helice* form. I have not seen *croceus* myself during the last two months but a fair number have been seen in the district. I found about 12 *M. aurinia* in the spring, all males, but have still to find the headquarters of the insect.—WALTER PIERCE; The Bungalow, Terry Road, High Wycombe.

POLYGONIA C-ALBUM IN STAFFS AND HEODES PHLAEAS AB. SCHMIDTII.—Mr. Overton, of Fairfield Mount, Walsall, and I took a small copper, ab. *schmidtii*, in Sutton Park, Warwickshire, a day or two ago; it was a perfect specimen. Also I took *P. c-album* in a garden here (Staffs), which I think is rather unusual.—J. D. W. SHEDDEN; 69, Highgate Road, Walsall, September 26th, 1921.

STAUROPIUS FAGI IN EPPING FOREST.—I was pleased to find that *Stauropius fagi* is still to be found in its old locality of Epping Forest, as this year on September 15th I beat out a small larva, and another full-grown specimen on the 18th of the same month.—A. W. MERA; 5, Park Villas, High Road, Loughton.

PERCNOPTILOTA FLUVIATA IN LANCASHIRE AND WESTMORLAND.—In all six specimens of this species have been taken locally this year. My own Westmorland dates are May 11th, June 5th and June 23rd, taken at light early in the evening (Witherslack). Mr. A. E. Wright has taken three also, at a light in one of his windows. These are Lancashire, therefore. The latest date (July 24th) seems to indicate that the species may have bred in this country this year. Newman and South consider it very rare in the north. Dr. Ellis' old Lancashire and Cheshire list mentions two specimens only for Lancs. Dr. Forsythe's Lancaster list (Ent. 1905) makes no mention of it. Mr. Wright also has a specimen that was taken at St. Anne's, Lancashire, within the last few years.—Dr. LOWTHER; Fernleigh, Grange-over-Sands.

SCARCITY OF SPILOSOMA LUBRICIPEDA.—At the conclusion of his notes on Lepidoptera in the Alton District (*antea*, p. 231), Mr. Stowell says he has seen but one single specimen of *S. lubricipeda* during the last four years, and asks whether it is getting scarce. During the same period I have not seen even one in this district and the same question has occurred to me. It used to be one of our commonest species. I should like to know if a similar experience has obtained in other parts of the country.—(Rev.) J. E. TARBAT; Fareham, Hants.

ICHNEUMONS ATTACKING COCOONS OF CERURA BIFIDA.—A few days ago when examining cocoons of *C. bifida*, pupæ of which I had reared from ova during the past summer, I was surprised to notice in several a tiny hole neatly drilled. Being curious to account for the presence of these I opened the cocoons showing them. In nearly every case I discovered the enclosed pupa to be dead and packed with the full-fed grubs of some small species of ichneumon. In one of the cocoons opened the parasite had evidently not long made its

entry, for I discovered it at rest on the apparently healthy pupa. Examination of the latter, however, under a fairly strong glass revealed the fact that the intruder had been there long enough to accomplish its purpose, for numerous ova were discovered, deposited in the spiracles, particularly those nearest the head. Disgusted as I was I could not help but admire the instinct that enabled the ichneumons to detect their hidden prey; to penetrate successfully a seemingly impassable barrier; and afterwards to deposit their ova in the most vulnerable parts of the pupa, the spiracles.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

LEPIDOPTERA AT LOWESTOFT IN AUGUST.—*Crambus alpinellus* was taken in two or three localities, notably and unexpectedly in a railway cutting about two miles inland from the sea. *C. latistrius* was there also in smaller numbers and one *Spilodes palealis*. A single *Eupoecilia degreyana* was taken amongst *Linaria*, and other insects of some interest were *Cerura bifida*, *Pheosia dictaeoides*, *Eugonia erosaria*, *Drepana binaria*, *Lithosia complana*, *Crambus contaminellus* *Homoesoma nimbella*, *Rhodophoea advenella*, *R. conso-ciella*, *Dichelia grotiana*, and *Eupoecilia anthemidana*.—H. C. HAYWARD; Repton, Derby.

LEPIDOPTERA FROM THE NEIGHBOURHOOD OF OUNDLE.—Several interesting species have been taken this year in Ashton Wold. *Colias croceus*, a few. *Melitaea aurinia (artemis)*, a single example was taken in Ashton Wold, where it has not been observed for many years. *Polygonia c-album*, hibernated specimens, and an example of the summer brood were observed, and one captured. *Callophrys rubi*, a butterfly usually very rare in this district, was obtained in Ashton Wold, and in Oundle Wood. *Manduca atropos*, *Hemaris scabiosae*, *Ino statice*, *Leucania pudorina* and *Agrotis cinerea* also occurred in, or in the neighbourhood of, Ashton Wold. The larvæ of *Euchelia jacobaeae* were exceptionally abundant, feeding in some cases both on the wild and the cultivated strawberry.—MIRIAM and ELIZABETH ROTHSCHILD; Ashton Wold, Oundle.

LEPIDOPTERA IN EAST TYRONE, 1922.—*Euchloë cardamines* was about in large numbers during the fine hot weather in May and early June, and the following aberrations occurred: *marginata*, Mihi, *dispila*, Raynor, and some deeply coloured forms of ab. *ochrea*, Tutt. Most of these were found at rest on *Cardamine pratensis* in the evening. On May 27th two females were captured with the fore wings, above and below, extensively blotched and streaked with orange, the second specimen taken being also the ab. *caulosticta*, Williams. By the way, in answer to Mr. Guy Stanton's query (*antea*, p. 238), the aberration mentioned by him is ab. *quadripunctata*, Fuchs, and is fairly common hereabouts. An interesting series of *Diaphora mendica* was bred during the month; they vary from almost pure white to a pale smoke colour. Several of the white forms have dark bars across the central area of fore wings; the parent of these forms was an almost pure white female, male parent unknown. Single examples of *Pyrameis atalanta* were observed in early June, but none have put in an appearance so far this autumn, to keep *Aglais urticae* company on the scabious flowers. About the middle of June *Ino*

statice was found in some members, but mostly worn, in a new locality in this district. The summer emergence of *Pieris napi* was remarkable for the large percentage of examples with the apical blotch, discal spots and inner marginal streak united, forming an unbroken band across the fore wings; this form occurs almost every season but is seldom common. On September 23rd a fine *Pieris brassicae* female was captured of a pale yellow colour, as well as another example with the discal spots united to the apical blotch by a suffusion of black scales.—THOMAS GREER; Curglasson, Stewartstown.

NOTES ON LEPIDOPTERA FROM THE CHILTERN HILLS, ETC., 1922.
—Butterflies were probably quite as plentiful in the Chilterns during the past season as in 1921, except that no extra broods of *Pararge egeria* var. *egerides*, *Lycæna icarus*, *Zizera minima* and *Heodes phlaeas* occurred this year. Insects seemed to appear more gradually, so that it was often possible to get specimens in fine condition several weeks after emergence commenced, in spite of periods of bad weather. *Melanargia galatea* was locally abundant from second week in July until the middle of August. Of *P. egeria* var. *egerides* the first brood was out at the beginning of May, the second about June 20th, and the third August 18th. The butterfly seems to occur in nearly all beechwoods, and is plentiful in some. One or two *Melitæa aurinia* were taken or seen in June on chalk slopes. Odd captures have been recorded several times during the last few years, and it is probable that the species is established in some restricted locality among the hills. *Agriades corydon* males were first seen on July 30th, the females being well out on August 13th, whilst freshly emerged specimens of both sexes were obtainable as late as September 3rd. Very plentiful in several localities, but scarce in others where sometimes common. *Pamphila comma* was locally abundant at the beginning of September. *Pieris napi* was unusually scarce, but the summer insects were sometimes exceptionally large and heavily marked; others corresponding to the spring form sometimes turned up in July and August. *Colias croceus* was seen or heard of in several localities in late August and early September. Sallows produced all the usual moths from the middle of March until Easter, sometimes in good numbers. *Parasemia plantaginis* was not uncommon on one hill in the Chilterns during June. *Abraxa ulmata* was plentiful. I found that the early morning was the best time to take it, when it was often seen in considerable numbers resting on brambles, fully exposed to view, in the beechwoods. Later in the day it retires under the leaves. Sugar was not very productive during August and September.—S. B. HODGSON; 3, Bassett Road, N. Kensington, W., October 9th, 1922.

ABERRATIONS OF *COLIAS CROCEUS* AND *AGROTIS EXCLAMATIONIS*.
—While looking through the collection of Lepidoptera belonging to my friend, Mr. F. Wood, of Ditchling, Sussex, I noticed two of his captures for this year which I think are worth recording. The first is a male specimen of *C. croceus* which is of the *helice* form which I understood to be peculiar to the female. The other, two specimens, a male and female of *Agrotis exclamationis*, in which the usual "heart and dart" marks are entirely obliterated by a dark cloudy suffusion

covering the whole of the discal cell, and sharply bounded thereby. The *croceus* was taken on the South Downs near Ditchling, and the *exclamationis* were both captured at sugar in Mr. Wood's garden in Ditchling village.—STANLEY N. A. JACOBS ; 5, Exbury Road, Catford, S.E.

ARICIA MEDON AB. ALBIANNULATA, HARR.—On August 14th this year I was so fortunate as to capture a well-marked male specimen of this form at Dartford, Kent. It is remarkable also in that the anterior end of the marginal series of red spots on the upper side of the fore wing is conspicuously powdered with white.—C. H. HARDS ; 40, Brewery Road, Plumstead, S.E. 18.

RETARDED EMERGENCE OF MESOLEUCA ALBICILLATA.—To-day, September 26th, on looking into my pupa cage I was surprised to see a newly emerged ♀ specimen of the above insect. It had only just completed the drying of its wings. The other portion of the brood, some twenty-five, had emerged normally in early June. South (Moths of the British Isles) mentions the occasional appearance of *M. albicillata* in the autumn. Possibly all such examples might be due to similar retarded emergence, and if this sort of thing happens with one species, why not with others that are perhaps regarded as partially double-brooded? —FRANK LITTLEWOOD ; 22, Highgate, Kendal, September 26th, 1922.

KILLING WITH CYANIDE.—I do not think that it is known—at any rate I have never seen the fact referred to in any book or journal I have ever read—that a butterfly or moth killed in the cyanide bottle (half an hour in a strong bottle will ensure death, although no harm accrues if left in longer) and then simply pinned or laid loose in a tin box (an empty tobacco tin will do) quite *dry* and without any *relaxing* agent whatever, will, *of its own accord*, in the space of about forty-eight hours (for an insect of average size, like *Pieris rapae*) return to its original natural flexible condition. A shorter period (say twenty-four hours) will suffice for small insects, whilst an *extra* day or even two days may be necessary for the largest moths. The tin may be kept in the ordinary sitting-room temperature. The same thing happens, of course, if the specimens are left *in* the killing bottle for an equal period of time, but it is only this season that I discovered that the happy result might be obtained in the above more convenient way, without the necessity of encumbering oneself with a number of reserve killing bottles. Cyanide of potassium is one of the best all-round killing methods, almost its only drawback being the “rigor” that it causes, and which renders immediate setting impossible. The above hint may enable even a busy collector to use cyanide more freely, as it is an easy matter to put each day's killing into a separate resting-tin and to affix the date. If, when the insects *have* arrived at the proper setting condition, it is not convenient to set them, I use a laurel leaf tin, which is admirable for *keeping* them relaxed, though apparently not at all necessary for bringing them to that state in the first instance. In any case, the shorter time any specimen is exposed to cyanide or laurel, or to any other killing or relaxing agent, the less likely are its colours to be injured.—FRANK LITTLEWOOD ; 22, Highgate, Kendal, August 23rd, 1922.

RECENT LITERATURE.

As was anticipated (*v. antea*, p. 167), Part 2, vol. i of the *Bulletin of the Hill Museum* was published on September 14th, and contains a number of valuable contributions to the study of the Macro-Lepidoptera. The first paper raises a point which is of considerable interest to systematists dealing with the Heterocera. It consists of four descriptions taken from the MS. compiled by Sir George Hampson, and left by him in the Natural History Museum on his retirement. This MS. is extremely voluminous, and was a continuation of the *Catalogue of the Lep. Phalanae in the British Museum*, and contains numerous descriptions of both genera and species to which Hampson had attached names, which latter he had also placed in the Collections without, however, indicating that the names were unpublished. This has led already to confusion on more than one occasion in the literature of the groups; but steps are being taken to avoid any possibility of a recurrence of the trouble. The bulk of the papers, by Messrs Joicey and Talbot, are the result of further work on the very valuable collections made by Messrs. Pratt in Buru, Ceram, New Guinea, etc., and include the description of very magnificent new *Papilio* of the *Acacus* group, very aptly named *prattorum*, from Buru, which has the same remarkable opalescent hind wings as the Philippine species *magellanus*—a discovery on which the Hill Museum is very much to be complimented.

The part unfortunately contains no illustrations, but it is understood that these will appear in the next part. In this connection the short article (Nomenclature and Illustrations) contributed by Mr. Talbot on the subject of M. Oberthur's dictum, "*Pas de bonne figure à l'appui d'une description, pas de nom valable*," is of interest, and undoubtedly expresses the common-sense view of this question. To make the validity of a name dependent upon the publication of a figure of the animal named, as well as a description of it, besides putting a premium on scientific work is simply impracticable. The importance of adequate illustrations is unquestionable; but the financial aspect of the proposition renders it at present hopelessly impossible.

A short article by Mr. W. H. T. Tams on *The Pollination of Early Spring Flowers by Moths* (*Journal of Botany*, lx, p. 203, 1922), produces some results not perhaps generally known to entomologists. The question was as to the length of the proboscis in certain species of moths which are normally on the wing in this country when the primrose is in flower; and it was found that virtually nothing whatever was known on the subject. Measurements were made of the tongues of a number of species, and it transpired that of the four species with tongues long enough to be of importance, one, *Cucullia verbasci*, was the only species which has ever been observed to visit any primrose. Results go to substantiate Darwin's original suggestion that primroses are pollinated by nocturnal Lepidoptera.

N. D. R.

WE very much regret to hear of the death recently of Mr. Arthur Horne, of Aberdeen. A notice will appear in the next number.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

—*July 27th, 1922.*—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. Step exhibited the insects he took on the Field Meeting at Netley Heath, July 15th, including *Strangalia armata* (Col.), *Volucella pellucens* (Dip.), etc.—Mr. R. Adkin, a short series of *Cupido minimus* with blue dusting, from Eastbourne, where it was abundant in May last, and generally large in size.—Mr. T. H. L. Grosvenor, *Zygaena anthyllidis*, *Z. transalpina* and *Z. scabiosae* sent from the Pyrenees by Mr. O. R. Goodman.—Mr. F. B. Carr, larvæ of *Nemoria viridata* from Witherslack, and of *Bapta temerata* from Horsley.—Mr. Barnett, a series of *Brenthis euphrosyne* from South Devon, and *Ematurga atomaria*, taken as late as June 22nd.—Mr. Hy. J. Turner, the race *alexandrina* of *Melitaea aurinia* with other races for comparison. It had abundance of light yellow markings on the fore wings.—Mr. Bell, larvæ of *Cerura bifida* and *C. furcula*, and stated that the ova were laid on the under sides of the leaves and not, as the books stated, on the upper. Also he showed larvæ of *Notodonta ziczac*. All were from ova found near Hatfield in June.

August 10th, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. D. W. Seth-Smith, 34, Elsworth Rd., was elected a member.—Mr. R. Adkin exhibited a series of *Arctia villica* reared from larvæ picked up on Eastbourne Parade. They were common this year, whereas larvæ of *A. caja* were unusually scarce.—Mr. Tonge, a bred specimen of *Malenydris salicata* from Langridge Fell.—Mr. Prideaux, aberrations of *Rumicia phlaeas* from Kent, and a remarkable aberration of *Mesoleuca albicillata* bred from Brasted.—Major Gillett, a unique black-banded form of *Agrotis corticea*, a very light ♂ and a dark ♀ of *A. cinerea*, and aberrations of *A. exclamatoris*, all taken in his light trap.—Mr. Bunnett, larva and imago of *Ledra aurita* (Hem.), the cicada *Centrotus cornutus*, from Boxhill, with the scarce beetle *Agrilus sinuatus* and *Rhinomacer attelaboides*.—Dr. Robertson, lepidoptera taken by him at Grindelwald in July. *Pieris napi* v. *bryoniae*, *Albulina pheretes*, *Acidalia immorata*, *Zygaena achilleae*, *Crambus myellus*, etc.—Mr. Hy. J. Turner, species of the South American genus *Automeris* mostly sent by his friend Mr. Lindeman, and read notes on their distribution and characteristics.—Messrs. Tonge, Ham and Carr reported the abundance of *A. villica* larvæ, the scarcity of *A. caja*, and the occurrence of *P. c-album* near and in Oxford, and fresh *C. croceus*, respectively.

August 24th, 1922.—Mr. E. Step, F.L.S., in the Chair.—Mr. Barnett exhibited series of two forms of the female of *Brenthis selene* from S. Devon.—Mr. Withycombe, the larva of *Limacodes testudo* beaten from oak at Oxshott with the Hemipteron, *Acanthosoma interstinctum*.—Mr. Sims, examples of the large earwig *Labidura riparia*, and referred to its burrowing habits. He had seen a fly carried in the forceps.—Mr. Main, the spider *Clotho durandi*, found under stones in S. France, with photographs of the structure of its snare, and read Fabre's remarks on the species.—Mr. Turner, exotic species of *Pieridae*, to show the extreme development of brilliant coloration with total, or almost total, suppression of the

white coloration on both surfaces.—Mr. Robert Adkin, pupæ of *Papilio machaon*; 3, spun up on a carrot leaf, on the glass of the food-bottle, and on a dark stick amid the food respectively, were pale yellowish green; 7, spun up on dark sticks leaning against the cage away from the food-plant, were putty-coloured with broad black stripes along the sides and wing-cases black, giving them a very dark appearance.

September 14th, 1922.—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—*Exhibition of Orders other than Lepidoptera*.—Mr. R. Adkin exhibited a large female of *Sirex gigas* from Eastbourne 70 mm. in expanse.—Mr. W. J. Lucas, Orthoptera—a brown form of *Mantis religiosa* from Spain, 1911; Neuroptera—specimens of *Palpares libelluloides* from Sierra de Carboneva and Algeciras, Spain, 1911–12, *Nemoptera bipennis* from Sierra de Carboneva, *N. coa* from Corinth, and *N. sinuata* from Macedonia and Syria; Hymenoptera—two specimens of the rare *Methoca ichneumonoides* taken by himself in the New Forest, one on August 27th of this year.—Mr. H. W. Andrews, the Diptera *Dioctria oelandica*, found after many years' search near Farningham, Kent; *Catabomba pyrastri*, a ♀ var. *unicolor*, from Shoreham, Kent; *Urophora cardui*, bred from thistle galls, and its hymenopterous parasites, also from Shoreham.—Mr. Hy. J. Turner, the curious "flue-brush" beetle, *Rhina barbirostris* (Curculionidae) from Brazil.—Mr. F. J. Coulson, var. *infusata* of *Xylophasia monoglypha*, August 22nd, at Wimbledon Common, and a blackish speckled form of *Boarmia gemmaria* bred from ova from St. Leonard's-on-Sea, with normal forms, and var. *perfumaria* from Wandsworth.—Mr. T. H. L. Grosvenor, eggs of Raptores from North India: Pondicherry Vulture from Jamsher, White-backed Vulture, Egyptian Vulture, and White-tailed Eagle.—Mr. E. Step, living Pyrenean newts (*Molge pyrenaicus* = *asper*), sent him by Mr. Goodman, and gave notes on its structure and habits.—Mr. C. L. Withycombe, Orthoptera: *Empusa egea* and *Oedipoda germanica* from S. France, *Psophus stridulus* from the Pyrenees, and a Mantid from the Straits Settlements with short prothorax and ill-developed fore legs.—Mr. Enefer, Coleoptera, *Clerus apivorus*, *Strangalia quadrifasciata*, both on cow-parsley; *Liparus germanus* and a Longicorn, both on pine logs; and a living *Carabus auratus*, all from Mürren, Switzerland. He also showed a yellow crab-spider, a wolf-spider (*Lycosa*) and the orb-spider (*Epeira fasciata*), from Clarens, L. of Geneva, and read notes on the last-named species.—Mr. H. Main, the wolf-spider *Lycosa picta*, sent to him by Mr. Bristowe from Oxshott, and described the habits of the young.—Mr. Cheeseman, a striated *Polyommatus icarus*.—Mr. B. S. Williams, Coleoptera from Harpenden; *Panagæus bipustulatus*, *Cassida hemisphaerica*, *Stilicus subtilis*, *Megarhtrus denticollis*, *Antherophagus nigricornis* and *A. pallens*, with *Quedius othiniensis* and *Aleochara spadicea* from moles' nests.—Mr. G. E. Frisby, Hymenoptera: *Ammophila luffii* from St. Ouen's Bay, Jersey, with *A. hirsuta* and *Bembex rostrata*; and the two British *Sapyga*, *S. 5-punctata* and the rare *S. clavicornis* from Wrotham.—Mr. Stanton, Coleoptera of economic importance: *Bruchus rufimanus* and *B. affinis*, with notes on their occurrence, habits, specific identity, etc.; *B. obtectus*, its origin and habits; *Anthonomus cinctus*, first

recorded as British in 1921, a pest of pears abroad.—Mr. Stanley Blenkarn, Coleoptera: (1) British species of *Bembidium*, (2) larger ground-beetles, (3) many species of water-beetles, (4) British *Chrysomelidae*.—Mr. Tonge, living larvæ of *Sphinx ligustri*, showing wide variation in the size and intensity of colour of the oblique stripes on the sides.—The Society, the Ashdown Collection of British *Chrysomelidae*.—The President, a specimen of the fungus *Mutinus caninus*, the lesser stinkhorn.

September 28th, 1922, Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Col. Rattray exhibited a large number of lantern-slides of birds' nests in India, and gave a lecture on the exhibit.—Mr. Edwards, the fungus *Pleurotus revolutus* from a felled poplar at Blackheath.—Mr. Sperring, specimens of the dark Lincolnshire race of *Brenthis euphrosyne*, and, on behalf of Mr. Coppeard, a dark-suffused aberration of the same species, an *Aphantopus hyperanthus* with a partial double row of eye-spots on the R. hind wing, an *Epinephele jurtina* with additional spots on the fore wings and another partially xanthic.—Capt. Crocker, aberrations of *Agriades coridon* from Royston, ab. *obsoleta*, ab. *striata*, ab. *roystonensis*, ab. *semisyngrapha* extended and approaching ab. *syngrapha*, females streaked with ♂ colour, brown-suffused females, ab. *marginalis* ♂s, ab. *caerulea*, asymmetrical specimens, etc.—Capt. N. D. Riley, for Mr. Hirst, Fabre's Banded Epeira (*Argiope bruennichi*), new to the British fauna, from Rye, Sussex, and the Gorse Red Spider *Tetranychus lintearius* from Devonshire.—Mr. B. S. Williams, species of Pentatomids from Harpenden district including *Podeps inuncta*, *Selurus bicolor*, etc.—Mr. Coulson, an abnormal cocoon of *Saturnia pavonia* in the shape of a dish, and aberrations of *Coenonympha pamphilus*.—Mr. Mera, living larvæ of *Colias croceus* (*edusa*) from ova laid by a female taken during the Field Meeting at Eastbourne, and a series of *Triphaena fimbria* bred from Epping Forest, generally dark in coloration compared with an old (1880) light specimen from Ipswich typical of the then specimens.—Mr. Enefer, *Callimorpha quadripunctaria* (*hera*) from Clarens, Switzerland, and *Erebia pronoë* from Mürren in August.—H. J. TURNER, Hon. Editor of Proceedings.

LONDON NATURAL HISTORY SOCIETY.—October 17th, 1922, Winchester House, E.C.—Mr. E. B. Bishop, President, in the Chair.—Among the exhibits were galls of *Dryophanta folii*, *D. divisa* (with flies emerging), *D. disticha*, *Andricus fecundator*, *A. collaris*, *A. globuli*, *A. trilineatus* (with flies), *A. glandulae*, all on *Quercus pedunculata* or *Q. sessiflora*; *Andricus testaceipes* on *Q. cerris*, *Diastrophus rubi* on *Rubus* sp., *Perrisia Dittrichi* on *Silva pratensis*, *P. rosarum* on *Rosa eglanteria*, *P. acercrispans* var. *rubella* on *Acer campestre*, *Perrisia* sp. on *Solidago virgaurea*, *Lasioptera populnea* on *Populus tremula*, *Contarinia* sp. on *Silene maritima*, *Rhodites eglanteriae* on *Rosa spinosissima*, *Eriophyes galii* on *Galium tricornu*, *Eriophyes* sp. aborting flower-buds of *Rumex acetosella*, *Eriophyes padi* on *Prunus padus*, and *E. geranii* on leaves of *Geranium molle*, while the rootstock was attacked by *Tylenchus devastatrix*.—Paper read, "London Fresh-water Fishes," by Mr. P. W. Horn.—H. J. BURKILL, *Minuting Secretary*.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Duplicates.—Cardamines, Megæra, etc. *Desiderata.*—A few of each: Paphia, Adippe, Cinxia, Egeria, Galathea, Lucina and Comma.—*H. W. Baker, 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.*

Duplicates.—Caia* (nice forms), Brunneata, Spartiata. *Desiderata.*—Common Butterflies, Hawks, Sesia, Bombyces.—*Edward Esson, 6, Esslemont Avenue, Aberdeen.*

Duplicates.—*L. coridon, L. bellargus, H. lineola, M. cinxia, M. athalia.* *Wanted.*—English forms of *C. typhon.*—*W. Clifford Nash, Clavering House, Bedford.*

Duplicates.—Andreniformis, Ochracea, Geminipuncta, Tenuiata, Citraria, Vetulata, Cervinaria, Lutosa. *Desiderata.*—Numerous, especially Bondii, Cannæ, Venosa, Cucullina, Fagi, etc.—*W. J. Newell, 22, Culloden Street, Poplar, E.*

Duplicates.—Varleyata, Athalia, Yellow Dominula, Seumibrunnea, Conspicillaris and many common species; send marked list wants. *Wanted.*—Cassiope, Betula, W-album, Cardamines ♂♂, Edusa, Iris, Hyale, Polychloros, Davus, Salmacis, Arion, Æsculi, Ligniperda and others; perfection only sent and required. *Also wanted.*—Many species of ova and pupæ; liberal exchange or cash.—*L. W. Newman, Bexley, Kent.*

Duplicates.—Valézina, Selene, Aurinia (dark type), Adonis, Argiolus pupæ, S. ocellatus,* Populi,* Complana, Omicronaria, Variata (grey type). *Desiderata.*—Ova or pupæ of many species.—*C. H. Newnham, Ringwood.*

Wanted, for examination of genitalia.—Nacaduba, all species, from India, Malaya, Dutch Indies, etc. Must be correctly labelled with localities. *Good exchange given in Ceylon butterflies.*—*W. Ormiston, Kalupahani, Haldummulle, Ceylon.*

Duplicates.—Sibylla,* Ægon, Betula,* Palpina,* Dictæa,* Dominula,* Plan-taginis,* Ripæ, Sublustris, Typica,* Tenebrosa, Thalassina,* Umbra,* Fimbria,* Tridens,* Ornithopus,* Statices, Abbreviata, Galiata,* Rivata,* Hastata,* Tetralunaria.* *Also pupæ of S. populi, Camelina, Lucina and Tetralunaria.* *Desiderata.*—Pupæ of many species.—*A. T. Postans, 148, Fawcett Road, Portsmouth, Hants.*

Duplicates.—Cardamines, Selene, Euphrosyne, Ocellatus,* Tilia,* Moneta,* Z. trifolii, Tridens. *Desiderata.*—Numerous.—*P. J. Rasell, Weedon Road, Northampton.*

Duplicates.—(Papered) French *A. cratægi.* *Exotics:* Papilio memnon, sikki-mensis, nomius, crino, evon, hector, clytia, demoleus, protenor, rhetenor, jophon, paris, ganesa, Parnassus hardwickii, epaphus, Colias nilagiriensis. *Desiderata.*—British pupæ and South American Rhopalocera.—*D. G. Sevastopulo, 147, Gloucester Terrace, London, W. 2.*

Wanted.—Pupæ of *P. piniperda* and *T. gracilis.* *Duplicates.*—*D. oo, X. ocellaris* and many others.—*H. Worsley Wood, 31, Agate Road, Hammersmith, W. 6.*

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesdays, November 1st and 15th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, November 9th, at 7 p.m., Ordinary Meeting. Paper, "The Second Maxillæ of the Odonata," W. J. Lucas, with lantern illustrations. Thursday, November 23rd, at 7 p.m., Annual Exhibition.—Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first Tuesday in each month, and sectional meetings on the third Tuesday. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GREGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

CONTENTS.

The Present Value of the Principal Works on the Palearctic Lepidoptera, *W. G. Sheldon, F.Z.S., F.E.S. (continued from p. 223), 241.* Henri Fabre and the Microgaster, *Rev. G. W. Crutchley, 245.* Mosquito Diagnosis: A Suggestion to Describe Wing-spots, Fork-cells and Palp-markings by means of Written Formulae, *Gilbert E. Brooke, M.A. Cantab., L.R.C.P. Edin., D.P.H., 247.* Some Undescribed Rhopalocera in the British Museum (Nat. Hist.), *N. D. Riley, 250.* Records from a South Hampshire Lepidopterist's Log-book for 1920, *A. T. Postans, 252.*

NOTES AND OBSERVATIONS.—Note on Synonymy of two Micro-Lepidoptera from British Columbia, *E. Meyrick, 254.* Probable Danger of a New Pest, *E. Meyrick, 255.* *Colias croceus* in N. Wales, *W. Bowater, 255.* *Colias croceus* and *Herse convolvuli* in Surrey, *Arthur Bliss, 255.* *Herse convolvuli* and *Colias croceus* at Wadhurst, Sussex, *A. H. Jones, 255.* *Herse convolvuli* and *Colias edusa* at Brighton, *F. G. S. Bramwell, 256.* *Herse convolvuli* in Hants and the Scilly Isles, (*Rev.*) *J. E. Tarbat, 256.* *Herse convolvuli* at Chichester, *Joseph Anderson, 256.* *Herse convolvuli* in the Isle of Wight, *H. H. L. Scott, 256.* *Polygonia c-album*, etc., in Bucks, *Walter Pierce, 256.* *Polygonia c-album* in Staffs and Heodes phleas *ab. schmidtii*, *J. W. D. Sheddton, 257.* *Stauropus fagi* in Epping Forest, *A. W. Mera, 257.* *Perenoptilota fluviata* in Lancashire and Westmorland, *Dr. Lowther, 257.* Scarcity of *Spilosoma lubricipeda*, (*Rev.*) *J. E. Tarbat, 257.* Ichneumons Attacking Cocoons of *Cerura bifida*, *A. T. Postans, 257.* Lepidoptera at Lowestoft in August, *H. C. Hayward, 258.* Lepidoptera from the Neighbourhood of Oundle, *Miriam and Elizabeth Rothschild, 258.* Lepidoptera in East Tyrone, 1922, *Thomas Greer, 258.* Notes on Lepidoptera from the Chiltern Hills, etc., 1922, *S. B. Hodgson, 259.* Aberrations of *Colias croceus* and *Agrotis exclamatoris*, *Stanley N. A. Jacobs, 259.* *Aricia medon ab. albiannulata*, *Harr., C. H. Hards, 260.* Retarded Emergence of *Mesoleuca albicillata*, *Frank Littlewood, 260.* Killing with Cyanide, *Frank Littlewood, 260.*

RECENT LITERATURE.—Bulletin of the Hill Museum, 261. The Pollination of Early Spring Flowers by Moths, 261.

SOCIETIES.—South London Entomological and Natural History Society, 262. London Natural History Society, 264.

FOR SALE.—From the library of the late Mr. F. B. NEWNHAM, M.A. Seitz' 'Palearctic Lepidoptera,' Lang's 'Butterflies of Europe'; also works by Kirby, Holland, Elwes, Tutt, Boisduval, etc. Particulars from M. J. HARDING, "Briarcot," Church Stretton.

Great Reduction in Prices.

Cabinets.

Hardwood, finished rich mahogany, panelled doors and sides.

Drawers, 17 × 16 × 2½ in. Lined cork or peat.

40-drawer, 12/6 drawer. 20-drawer, 13/6 drawer.

Store Boxes.

10 × 8 in.	13 × 9 in.	14 × 10 in.	16 × 11 in.	17 × 12 in.
3/11.	5/-.	6/6.	7/9.	9/-.

Compo Cork Sheets.

12 × 4 × ½ in.
1/4 doz. 1½d. sheet.

G. A. BENTALL, 392, Strand, London, W.C. 2.

Vol. LV.]

DECEMBER, 1922.

[No. 715.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

F. W. FROHAWK, F.E.S., M.B.O.U.

CLAUDE MORLEY, F.E.S., F.Z.S.

C. J. GAHAN, D.Sc., M.A., F.E.S.

N. D. RILEY, F.E.S., F.Z.S.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made.

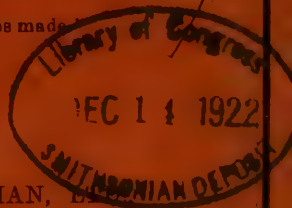
LONDON:

ADLARD & SON & WEST NEWMAN, Ltd.

BARTHOLOMEW CLOSE, E.C. 1.

Double Number.

Price Two Shillings and Sixpence Net.



WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

ADDITIONAL PREMISES.

W. F. H. ROSENBERG begs to announce that he has opened
a NEW BRANCH ESTABLISHMENT at

25, CROMWELL PLACE, SOUTH KENSINGTON, S.W. 7

(opposite the Natural History Museum).

Telephone: Western 6776.

FOR THE SUPPLY OF

Entomological and other Natural History Requisites, Cabinets, Specimens and Books.

CATALOGUES POST FREE ON APPLICATION.

Head Office and Museum as heretofore at 57, HAVERSTOCK HILL, N.W. 3.

CABINETS.

Finest Materials. Best Workmanship
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

THE ENTOMOLOGIST.

VOL. LV.]

DECEMBER, 1922.

[No. 715

EDITORIAL.

CAPTAIN NORMAN D. RILEY having consented to take over full editorial duties, I have great pleasure in stating that he will be the Editor of the next volume of this Journal. During his novitiate this year he has not only introduced himself to our readers, but has secured the writings of several new contributors to our pages, and in many other ways added to the utility of the Entomologist.

Feeling therefore that the Journal will be in good hands I trust that the same kindly indulgence will be extended to him as it has been my gratification to receive during the past three decades.

To my coadjutors on the Reference Committee my sincere thanks are cordially tendered for advice and assistance throughout my editorship.

RICHARD SOUTH.

THE PRESENT VALUES OF THE PRINCIPAL WORKS ON THE PALÆARCTIC LEPIDOPTERA.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 244.)

Works Published in Germany and Austria.

Borkhausen, M. B. *Naturgeschichte der Europäischen Schmetterlinge*; 5 vols; Frankfort, 1788-94; 2 coloured plates. An important work embodying many type descriptions of European Lepidoptera. Catalogued at 10s. to 12s. (1912).

Charpentier, T. von, und Zincken, J. L. *Die Zinsler, Wickler, Schabe, und Geistchen der Wiener Gegend*; 1 vol.; 178 pp., Brunswick, 1821. This work is a description of the Micro-Lepidoptera contained in Schiffermüller's collection and an identification of them with Hübner's figures. The joint authors went through the whole collection at different dates and it is obvious the result of their work should be in the hands of every micro-lepidopterist. The book can often be obtained for about 5s. Schiffermüller's descriptions are not sufficiently full in the majority of cases to permit of identification by them alone.

Esper, E. J. C. *Schmetterlinge Europäischen*; 5 vols. and 1 vol. supplement; Erlangen, 1777-1794; 440 coloured plates.

The great value of Esper as a work of reference is that he described and figured so many types of species. His figures are fairly good and nearly always recognisable. Catalogued at from £10 to £12 10s. (1912). Recently the price has greatly increased and it is now catalogued at from £25 to £30. A second edition of this work was brought out by T. von Charpentier in 1829-39. The disadvantage of this edition is that the plates, though usually considered equal to the original edition, are not, of course, coloured by or under the supervision of Esper. This edition is usually priced a little lower than the original one.

Fischer, J. E. (von Röslerstamm). *Abbildungen zur Berichtigung und Ergänzung der Schmetterlingskunde besonders der microlepidopterologie*; 100 coloured plates; Leipzig, 1838. The plates of this work are very beautiful. It was catalogued in 1912 at £4 and £5 10s.

Frey, H. *Die Lepidopteren der Schweiz*; 1 vol., 454 pp.; Leipzig, 1880. An extremely useful work dealing with both macros and micros. It should be in the hands of every student and especially those who visit Switzerland. It can usually be purchased second-hand for 5s. or 6s.

Freyer, C. F. *Beiträge zur Geschichte Europäischer Schmetterlinge*; 3 vols.; 144 coloured plates; Nuremberg, 1828-30; and *Neure Beiträge zur Schmetterlingskunde*; 7 vols.; 700 coloured plates; Augsburg, 1833-58. These works have very beautiful plates, and those of the larvæ especially, of which large numbers are figured, are very useful. The former work was catalogued in 1912 at from £2 5s. to £3 and the latter at from £11 to £14.

Frölich, G. F. A. *Enumeratio Tortricum Württembergiæ*; 1829; 102 pp. An extremely useful little book for students of the Tortricidæ, catalogued in 1912 at 3s.

Gerhard, B. *Monographie der Lycænen*; Hamburg, 1853; 39 coloured plates. In this monograph the plates are good. As it figures and names a number of aberrations of the European Lycænidæ it is essential to all students of that group. Catalogued in 1912 at £3 5s. and £3, 15s.

Heinemann, H. *Schmetterlinge Deutschlands und der Schweiz*; 2 vols.; Brunswick, 1859-76. Essential to all microlepidopterists. Catalogued in 1912 at £3 15s. to £5 10s. The value of this book is increasing in consequence of its rarity.

Herrich-Schäffer, G. A. W. *Systematische Bearbeitung der Schmetterlinge von Europa*; 6 vols.; 636 coloured and 36 uncoloured plates; Regensburg, 1843-1856. This magnificent continuation of Hübner's "Sammlung" is one of the most important works ever issued on the subject. The plates are very beautiful and even the smallest species figured is easily

recognisable. It was catalogued in 1912 at £40 and £47 10s. and recently at £60. Dr. Chapman's copy brought at auction £42, and the last previous copy that came into the market, from the library of F. D. Godman, certainly very beautifully bound, was acquired by the writer for a considerably higher figure. Herrich Schäffer's work is much scarcer, at any rate in Britain, than that of his predecessor Hübner.

Hübner, Jacob. *Sammlung Europäischer-Schmetterlinge*; 1 vol. of text and 789 coloured plates; Augsburg, 1796–1841. The most important work ever issued on European Lepidoptera. The plates are all hand-coloured and are extremely beautiful. From the great number of types named and figured the work is indispensable to the student. It is unfortunately rare. Apparently only a small number of copies were issued. The list of subscribers in my copy, which was formerly in the library of the Rev. W. Bree, is given at 69 only, and as several of those named took four, and one six, copies the names evidently included those of booksellers as well as private individuals. I fancy we have more copies in Britain than the continentals possess, in proportion of course to our population, for I know of at least a dozen in Britain, of which more than half are in public libraries. The work is at present catalogued at from £50 to £68, the price depending upon the amount of text and number and condition of plates. Most of the copies contain the full number of plates, but the text—fortunately this is not extremely important from the student's point of view—is apt to be very fragmentary, copies with full text being extremely rare; I know of only two in Britain.

Hübner, J. *Geschichte Europäischer Schmetterlinge*; Augsburg, 1796–1841 or 1842. The most beautiful work ever devoted to the earlier stages. It is extremely scarce. The number of plates varies greatly—more so than in any other work I am acquainted with. Hagen gives 449 and probably this is about the usual number, but I have seen a copy with 500 plates; on the other hand that of Dr. Chapman, which is in my possession—formerly it belonged to Fredk. Bond—contains only 126. A copy with 447 plates was catalogued in 1912 at £37 10s.; one with the same number in 1922, £42, and one with 500, £60.

Hübner, J. *Sammlung auslesener Vogel und Schmetterlinge*; 100 coloured plates; Augsburg, 1792. An extremely quaint old book, mostly devoted to birds, as its title suggests, but each of the plates, or many of them, contain a figure of one or more lepidoptera, and as many of these are the type figures, the book is valuable. Unfortunately it is extremely rare, one of the very rarest books on the subject in fact. I believe the only copy in Britain is the one in the library of Lord Rothschild.

I have never known anyone who cared to put a value on this book, but a bookseller would possibly ask anything over £30 upon it.

Hübner, J. Verzeichniss bekannter Schmetterlinge; Augsburg, 1816–26. This volume of 431 pages marks an era in the literature, for it represents the genesis of the genera of the order, as well as Hübner's final views on many of his names. It is, of course, absolutely essential to every student. It seems scarce, being seldom catalogued, but in 1912 it was priced in a German catalogue at 4s. 6d. and in 1919 I obtained a copy from Germany at about the same figure.

Kennel, J. von. Die Palæarktischen Tortriciden; 727 pages of letterpress and 24 large coloured plates (each of which contains about 100 figures); 1908–21. The latest work on the Tortricidæ. The plates are excellent, but the nomenclature of the forms figured is extremely incorrect in many cases. The letterpress is very useful as it brings what is known of the life-histories up to date. The price at the present moment I am quoted is £6.

Ochsenheimer, F., und Treitschke, F. Die Schmetterlinge von Europa: 10 vols.; Leipzig, 1807–1834. The first four volumes were written by Ochsenheimer, the last six by Treitschke. The value of this book is about 15s. It is, of course, valued for the number of type species it describes.

Poda, N. Insecta Musei Græcensis; Widmansbad, 1761. A little volume containing a number of original descriptions. It is extremely rare. There are, I believe, only two or three copies in Britain, one of which is in the Library of the Entomological Society. It would be extremely difficult to put a value on this little book, but if a bookseller who knew his business had one he would probably ask £40 or £50, or more, for it, although a well-known firm sold one not so many years ago for five shillings!

Rebel, H. Studien über die Lepidopterenfauna der Balkländer; 3 Tiel; 3 coloured plates; Vienna, 1903–1913. A very useful fauna list of certain parts of the Balkans. The plates are extremely good. To be obtained for about 30s.

Rösel von Rosenhof, A. J. Insecten-Belustigungen; 4 vols.; with Kleeman's Beiträge, 2 vols., 6 vols. in all; 404 coloured plates; Nuremberg, 1746–93. Rösel was a miniature painter, and his work contains some of the most beautiful figures that have ever been produced. Apart from this much of its value results from subsequent authors in describing a species identifying it with Rösel's figures. There were several editions of variable value, and copies with the total number of plates are rare. The original and best edition is extremely scarce. I

only know of two in Britain : one in the Library of the Royal Society ; the other is one I picked up a few years ago at a second-hand bookseller's ; it was at one time the property of J. C. Dale, and contains his book-plate. The present price of a copy is from £5 to £12, dependent on whether it is perfect or not. I was, however, offered in 1919 a perfect copy by a Berlin bookseller for the price of £50 English money. It is needless to say I did not close with the offer.

Schiffermüller (and Denis). *Systematisches Verzeichniss der Schmetterlinge der Wiener Gegend* ; 1 vol. ; 322 pp., 3 plates ; Vienna, 1776. This work, one of the earliest after Linné, contains a large number of original descriptions ; unfortunately they are so brief that many of them are unrecognisable. Fortunately what with the references Schiffermüller makes to other authors, and the references other almost or altogether contemporary authors make to his book, we are, however, certain we recognise most of the insects he describes. Copies of this book are not infrequently in the market at about 10s. each.

Scopoli, J. A. *Entomologia Carniolica* ; 1 vol., 420 pp. ; Vienna, 1763. This little book, even earlier than the last, is valuable for the same reason that it is. It can usually be purchased for about 5s.

Seitz, A. *Macrolepidoptera of the World (Palæarctic Section)* ; 4 vols. ; 245 plates ; Stuttgart, 1909-1920. Purports to describe and figure all the Lepidoptera of this region. Many of the figures are good, and some of the letterpress, which is the work of several writers, is good also. The whole work is extraordinarily cheap, and as it is the only illustrated modern work dealing with the region everyone should have a copy. It is to be procured for £13.

Sorhagen, L. *Klein Schmetterlinge der Mark Brandenburg* ; 1 vol., 376 pp. ; Berlin, 1886. An extremely practical and useful work dealing principally with the earlier stages. Can be purchased for a few shillings.

Spuler, A. *Die Schmetterlinge Europas und Raupen* ; 4 vols. ; 155 coloured plates ; Stuttgart, 1901-10. A popular and very useful work. For the price the plates are very good, and no student of European Lepidoptera should be without a copy. It was catalogued in 1912 at £3 and £4 5s., and in 1922 at £3 3s. and £4 4s.

Wagner, H. (Edited by). *Lepidopterorum Catalogus* ; Berlin, 1911. An enormous work purporting to give the Bibliography of every Lepidopteron of the world. This work, the necessity for which will be obvious to everyone, is a collaboration of several well-known writers, and as is usual in such cases the

work is very unequal in quality. 26 parts which form 4 fairly bulky volumes have been issued, and I understand from the publishers, Herr Junk, of Berlin, the present price of them is £4.

There are many German magazines that have appeared during the last century and a half. Amongst the most useful are :

Berliner Entomologische Zeitschrift; Berlin. Commencing in 1857. A set, 1857-1907, was priced in 1912 at £12 10s.

Deutsche Entomologische Zeitschrift; commencing in 1881. A set, 1881-1911, was priced in 1912 at £14.

Entomologische Nachrichten; Berlin, 1875-1900. A complete set in 1912 was catalogued at £4 5s.

Iris. The publication of the Dresden Entomological Society. Commencing in 1884. A set, 1884-1911, was catalogued in 1912 at £13.

Stettiner Entomologische Zeitung; Berlin. Commencing 1840. A set, 1840-1910, was offered at £18 10s.

Weiner Entomologische Zeitung; Vienna. Commencing in 1882. A set, 1882-1908, was valued in 1912 at £7 10s.

Illiger's Magazin f. Insectenkunde; Braunschweig, 1802-7. Priced in 1912 at 22s. and 25s.

(To be continued.)

A NEW GENUS AND SPECIES OF MICRO-LEPIDOPTERA FROM NEW ZEALAND.

By E. MEYRICK, B.A., F.R.S.

Fam. PLUTELLIDÆ.

Thambotricha, *gen. nov.*

Head with appressed scales; ocelli posterior; tongue developed. Antennæ $\frac{5}{6}$, in ♂ slender, joints elongate, with spreading whorls of extremely long fine ciliations, basal joint moderate, rather stout, with rather small pecten. Labial palpi long, recurved, second joint thickened with scales forming a very short apical tuft beneath, terminal joint somewhat shorter than second, rather thickened with scales, pointed. Maxillary palpi very short, drooping, filiform. Posterior tibiae with series of rough projecting bristly scales above. Fore wings with 1b furcate, 2 from $\frac{5}{6}$, 7 to termen, 11 from middle. Hind wings $\frac{4}{5}$, elongate-trapezoidal, cilia $1\frac{1}{2}$; 2 remote, 3 and 4 approximated at base, 5-7 somewhat approximated towards base.

* A remarkable form, perhaps nearest to *Dolichernis*, but very distinct.

Thambotricha vates, *sp. nov.*

♂ 14 mm. Head pale ochreous, side-tufts bronzy. Palpi bronzy-fuscous. Antennal ciliations 8. Thorax purple-bronzy-ochreous.

Abdomen whitish-ochreous. Fore wings elongate, narrowed towards base, costa sinuate, apex pointed, termen faintly sinuate, oblique; pale yellow overlaid with purple-bronzy-ochreous, costal edge pale yellow from $\frac{2}{5}$ to $\frac{4}{5}$; discal stigmata remote, rather dark fuscous, an additional dot beneath and rather before second, these two partially surrounded with pale yellowish; a slender terminal streak of purple-fuscous suffusion; cilia whitish-yellowish, on costa suffused purple-ochreous, darkest above apex, on dorsum pale ochreous tinged purple, cilia extending to before middle of dorsum. Hind wings and cilia ochreous-whitish.

Wellington, in March, one specimen swept from forest growth by a young collector, Edward C. Clarke, aged 14, and kindly forwarded by Mr. Hudson. It is permissible to hope that the discoverer of this very interesting species may be thus early inaugurating a distinguished entomological career.

Thornhanger,
Marlborough;
October 31st, 1922.

RECORDS FROM A SOUTH HAMPSHIRE LEPIDOPTERIST'S LOG-BOOK FOR 1920.

By A. T. POSTANS.

(Continued from p. 254.)

The 20th was calm and cloudy with a south-west breeze during the day. At sunset I went to the downs and sugared posts. *Grammesia trigrammica* and *Mamestra dentina* came in abundance, and I took one female *M. genistae*, but there was little else. My net gave me one or two *Phibalapteryx vitalbata* and a male *Agrotis cinerea*, whilst *Amoebe viridaria* was flying commonly and in superb condition. The 23rd was a beautifully calm, sunny day, and the warmest of the year as yet. I spent the day in the woods, and saw numerous *C. rubi*, in fresh condition, disporting over short herbage in company with *Euclidia glyphica*, *E. mi*, *Aricia medon*, etc., also several *P. cardui* and *V. io*. Beating produced *E. hastata*, *Epione advenaria*, etc., but this method of collecting was not so productive as it sometimes is. Larva-beating likewise was not very encouraging; however, I obtained a few small *Z. betulæ* from sloe, and small larvæ of *Cucullia verbasci* were common on mullein. The 24th was another bright day, and being a bank holiday I went to the woods in another locality to look over the imagines of *Brenthis euphrosyne* for varieties, but, although typical specimens were numerous, I saw none worth taking. I netted a few *Nemeobius lucina*, a solitary *Hemaris fusiformis*, and *Lithosiæ sororcula*, but nothing else. I do not remember observing a single specimen of *C. rubi* all day in this locality.

The evening of the 25th was calm and slightly cloudy, wind S.W., and moon in second quarter. At sunset I went to the downs and sugared posts. *G. trigrammica* came in profusion, but *M. dentina* was much less in evidence than on the 20th, and I saw numerous *Apamea basilinea* and three *Agrotis cinerea*, in addition to one that I discovered newly emerged and drying its wings at the base of one of my sugared posts. I netted *Cidaria truncata*, *P. vitalbata* and *E. pumilata*, but very little seemed to be flying. In the evening of the 27th I went again to the downs, but as they were enshrouded in mist I abandoned the original intention of sugaring and confined my attention to campion bloom in the lanes; but the weather conditions seemed to be unfavourable, and very few insects were flying, so I only obtained a couple of *E. venosata* and *D. carpophaga* and odd *D. cucubali*, *E. haworthiata*, *E. vulgata*, etc. On the 28th ova of *E. atomaria* hatched from a female taken on the 16th, and *N. typica* was bred.

June 1st was calm and clear in the evening after a cloudy, warm day, wind S.W., full moon rising. At sunset I went to the downs and sugared posts as before. Some nice banded vars. of *G. trigrammica* were taken and the type was in profusion, but getting worn. The only other species seen were a couple of *M. dentina*, one *H. adusta*, also a few *A. basilinea*, and I netted *Noctua c-nigrum*, *D. cucubali*, *Acidalia marginepunctata*, etc., and *E. venosata* in abundance over campion at sunset. The 2nd was warm and sunny, and in the afternoon I went to the woods on a last venture for vars. of *B. euphrosyne*, but I saw none worth taking, and the type was practically over as they were much worn. *B. selene* was just appearing and I saw numerous beautifully fresh specimens, but all typical, so did not take any. Larvæ of *L. sibylla* I noted in abundance on honeysuckle, frequently half-a-dozen on one vine. Ova of *N. lucina* deposited on May 24th hatched this day. The evening of the 3rd was warm and calm after a southerly breeze during the day, so at dusk I visited campion bloom in the lanes. I found *E. venosata* flying commonly, but they were now much worn; also I netted a couple of fresh *D. cucubali* and *D. carpophaga* in addition to *Neuria reticulata*. I found *H. sordida*, *A. puta*, *G. trigrammica*, etc., rather commonly at honeydew on nettles. Imagines of *A. villica* commenced to appear in my cages on the 6th. At sunset on the 7th I visited campion bloom again and saw practically all the species noted on the 3rd, *H. sordida* in profusion. Larvæ of *Ortholitha cervinaria* were common on mallow and were of all sizes, some quite tiny while others were almost full fed. The evening of the 10th was beautifully clear with a rather strong breeze from the south-west. I went to the lanes at dusk, but I only saw a few of the most common species flying round the campion. No *N. reticulata*, which I went for chiefly. I boxed a solitary specimen of the delicate *Acidalia subsericeata* from a

grass-stem. On the 12th ova of *E. hastata* hatched and I successfully reared 80 per cent. of the larvæ on birch in large glass-topped boxes, and eventually these all pupated. The forenoon of the 13th was cool and somewhat cloudy after twenty-four hours' steady rain. However, the weather showed signs of improving, so I went to the woods for the day, it being Sunday. I found *Z. trifolii* out in numbers, but they were somewhat worn although I managed to secure a few good confluent forms. The only other insects observed were a few *P. plantaginis* and *A. medon*. Half-grown larvæ of *C. verbasci* occurred on almost every plant of mullein noticed. By beating sloe bushes growing by the roadside on my way home I obtained larvæ of *A. pictaria*, and from sallow a few small *Notodonta ziczac*, *N. palpina*, *S. libatrix*, etc., but no *P. retusa*, as I was rather late for this species, they having probably gone down for pupation.

The 14th was very bright all day with a south-westerly breeze which dropped to calm in the evening. The conditions seemed favourable for night work, so at sunset I went to the downs and sugared posts, and when I had finished this preliminary occupation I rigged the net and went to see what was going at the campion bloom. There were many moths flying round it, but they were very much on the alert, and I had great difficulty in approaching near enough to see what species were represented. *H. sordida* seemed to be the commonest, with *M. dentina* a good second, and I had the good fortune to get a few *N. reticulata*. I have always found this species difficult to capture, as on the slightest alarm it dives at once into the campion bed, and emerges somewhere round the edge where least expected and is off like a flash. *A. subsericeata* was now well out and I boxed several from the grass stems, and netted *X. galiata*, *X. rivata*, etc., on my way to look at the sugar patches. I found moths swarming on them and they dropped off in numbers when I turned the light on them. The commonest seemed to be *A. corticea*, *T. pronuba* and *A. exclamationis*, and I took a beautiful variety of the latter in which the orbicular and reniform marks are united to form an irregular rayed blotch over the centre area of the fore wings. In addition I took five *X. sublustris*, numerous *X. hepatica*, some richly suffused with reddish purple, and I observed several fresh *L. pallens*, the first of the season. Countless larvæ of *Hipparchia semele* and *Epinephele jurtina* were feeding on short grass by the roadside. On the 15th imagines of *Sphinx ligustri* commenced to appear in my cages. They were reared from ova from a female that I captured on the sand dunes last summer.

(To be continued.)

LIGHT TRAP EXPERIMENTS IN CONNECTION WITH TEMPERATURE, ETC.

BY MAJOR FREDERICK GILLETT.

IN Whitaker's Almanac will be found the amount of light and darkness each night given in the form of a rectangle divided into four equal squares, each square representing one quarter (3 hours) of the period from 6 p.m. to 6 a.m., the shaded squares being darkness, when there is no light from the sun or moon. These data have been accepted in the following tables. The temperatures which I give are the shade temperatures at 8 a.m. The trap has been run from 10 p.m. to 3 a.m. (summer time when that is used), the electric light being cut off automatically by an alarm clock, but I did not begin to run it consecutively till the beginning of May, since which date, however, I ran it regardless of weather whenever I was at home. The numbers of moths are given regardless of species, although it is curious that on certain nights a particular class of moths may be attracted. For instance, one night there may be several species of Prominents, whereas the next night there may be none, but instead, perhaps, Poplar and Eyed Hawks.

A dark, warm, thundery night with a drizzle of rain will nearly always bring a large number of moths to the trap, although one is quite as likely to obtain something good when very few captures are made. My impression is that a dark night is better than one with a bright moon, but at the same time I do not consider it an invariable rule. Temperature does not appear to have much effect, except when it drops very low. Males come to light far more freely than females; at the same time a very fair sprinkling of females will be found amongst the captures, and I have even had batches of eggs laid in the trap during the night.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
April 9th	36°	<i>Nil</i>	Light all night.
" 29th	44°	6	Dark 9 p.m. to 6 a.m.
" 30th	42°	6	" 12 a.m. to 3 a.m.
May 2nd	44°	4	" " "
" 4th	46°	4	" " "
" 5th	44°	1	Light all night.
" 6th	47°	1	" "
" 7th	50°	1	" "
" 8th	60°	5	" "
" 9th	60°	2	" "
" 10th	50°	4	" "
" 11th	44°	<i>Nil</i>	" "
" 14th	49°	1	Dark 9 p.m. to 12 a.m.
" 15th	50°	2	" " "
" 20th	56°	4	" 9 p.m. to 3 a.m.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
May 21st	61°	10	Dark 9 p.m. to 3 a.m.
" 22nd	71°	17	" " "
" 23rd	71°	15	" " "
" 24th	71°	16	" " "
" 25th	66°	21	" " "
" 27th	61°	20	" " "
" 28th	58°	16	" " "
" 29th	62°	17	" " "
" 30th	64°	52	" 12 a.m. to 3 a.m.
" 31st	68°	58	" " "

It will be noted this month that on the 8th there was a considerable rise in temperature; the captures, however, did not increase to any extent with it, in fact they were less than at the end of April—possibly the darkness then accounting for it. On the 22nd there was again a considerable increase in temperature with a small increase in captures. On the 30th there was a jump in the number of captures, without any great increase in temperature, but a lengthening in the hours of darkness. In this month the darkness appears to have had more effect than the temperature.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
June 1st	66°	73	Dark 12 a.m. to 3 a.m.
" 2nd	69°	57	" " "
" 3rd	62°	127	" " "
" 4th	55°	84	Light all night.
" 5th	58°	67	" " "
" 6th	61°	54	" " "
" 7th	64°	50	" " "
" 9th	58°	69	" " "
" 10th	59°	139	" " "
" 11th	60°	258	" " "
" 12th	60°	112	" " "
" 13th	62°	145	Dark 9 p.m. to 12 a.m.
" 14th	50°	125	" " "
" 17th	56°	630	" " "
" 18th	56°	149	" " "
" 19th	64°	397	" " "
" 20th	58°	286	" 9 p.m. to 3 a.m.
" 21st	62°	247	" " "
" 22nd	59°	133	" " "
" 23rd	59°	162	" " "
" 24th	59°	190	" " "
" 25th	55°	129	" " "
" 26th	55°	81	" " "
" 27th	58°	168	" " "
" 28th	59°	155	" " "
" 29th	54°	164	" 12 a.m. to 3 a.m.
" 30th	55°	43	" " "

On the 17th of this month there was an extraordinary number of captures for no apparent reason. On the 30th there was a great decrease in captures, also without any satisfactory reason. Whether the lack of honey dew this month had anything to do with the captures I can't say, but it may be a factor in the case.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
July 1st	56°	57	Dark 12 a.m. to 3 a.m.
" 2nd	58°	60	" " "
" 3rd	56°	113	" " "
" 11th	56°	40	Light all night.
" 13th	57°	48	" "
" 14th	57°	43	" "
" 15th	52°	89	Dark 9 p.m. to 12 a.m.
" 16th	57°	51	" " "
" 17th	57°	22	" " "
" 18th	52°	106	" " "
" 19th	56°	44	" " "
" 20th	58°	88	" " "
" 21st	61°	62	" 9 p.m. to 3 a.m.
" 22nd	64°	100	" " "
" 23rd	59°	88	" " "
" 24th	54°	108	" " "
" 25th	56°	73	" " "
" 26th	60°	118	" " "
" 27th	60°	45	" " "
" 28th	58°	96	" " "
" 29th	59°	70	" " "
" 30th	63°	80	" 12 a.m. to 3 a.m.
" 31st	56°	46	" " "

The three nights, 11th, 13th, 14th, when it was light all night, produced a poor record of captures compared with the rest of the month, otherwise there was no particular feature to which to draw attention.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
Aug. 1st	54°	43	Dark 12 a.m. to 3 a.m.
" 2nd	57°	23	" " "
" 3rd	56°	27	" " "
" 4th	56°	30	Light all night.
" 5th	58°	24	" "
" 6th	60°	14	" "
" 7th	59°	30	" "
" 8th	58°	17	" "
" 9th	55°	8	" "
" 10th	54°	31	" "
" 11th	53°	8	" "
" 12th	54°	22	Dark 6 p.m. to 9 p.m.
" 16th	54°	13	" 6 p.m. to 12 a.m.

Date.	Temperature, 8 a.m.	No. of moths.	Remarks.
Aug. 17th	59°	11	Dark 6 p.m. to 12 a.m.
" 18th	54°	7	" " " "
" 19th	55°	45	" " to 3 a.m.
" 20th	60°	96	" " " "
" 21st	59°	18	" " " "
" 29th	60°	32	" 12 a.m. to 6 a.m.
" 30th	58°	26	" " " "
" 31st	54°	9	" " " "
Sept. 1st	50°	3	" " " "
" 2nd	51°	3	" 3 a.m. to 6 a.m.
" 3rd	51°	4	" " " "

One asks oneself what was the cause of the increase in the captures on 19th and 20th; the temperature gives no clue, the amount of darkness increased, but it was the same on the 21st when the numbers fell.

From these tables it appears that the hours of darkness have some effect, the temperature during the summer months at any rate little or none.

Cheriton House,
Sevenoaks,
Kent.

NOTES AND OBSERVATIONS.

EUCHLOË CARDAMINES AT CHICHESTER IN SEPTEMBER.—Mr. Guy Stanton, of Dunston College, Rocester, Staffs, writes to me as follows: "It may interest you to know that while staying at Chichester for several days I noticed two specimens of *Euchloë cardamines* on September 13th, and succeeded in taking one, a male, near Boxgrove Priory."—JOSEPH ANDERSON; Chichester.

COLIAS CROCEUS AB. *FAILLÆ* AND *HERSE CONVULVULI* IN LINCOLNSHIRE.—On September 3rd on the railway bank not far from my house I took a specimen in excellent condition of *Colias croceus* ab. *faillæ* Stef. I see the late Mr. Rowland Brown refers to this aberration as follows: "Often occurs near Florence and is no doubt widely distributed elsewhere." It would be interesting to learn whether any other captures have been made this year in England. On the day previous to this my neighbour brought me a large moth that he had found at rest in his garden frame; on examination it proved to be *Herse convolvuli* in good condition.—G. T. PIGOTT (Major); Somerby, Barnetby, Lincolnshire.

COLIAS CROCEUS AT PLYMOUTH.—*Colias croceus* was plentiful at the end of August near Plymouth. I saw quite thirty one morning in the limestone quarries at Pomphlett, and was fortunate enough to note two var. *helice*, one of which I took. I also captured a female

intermediate* in shade between the var. and the normal.—C. W. BRACKEN, B.A., F.E.S.; Corporation Grammar School, Plymouth.

HERSE CONVULVULI AT BEDFORD.—Two specimens of this species were taken in September in the County Hospital but were badly damaged by the captors.—W. GIFFORD NASH; Clavering House, De Parys Avenue, Bedford.

DAPHNIS NERII OFF SCOTLAND.—A good specimen of *D. nerii* has just come into my possession. It was taken on a trawl-boat off Buchan Ness, Aberdeenshire, in September, 1917. There was a large pin through it, but I have managed to extract this and reset the specimen.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

ACHERONTIA ATROPOS AT SEA.—Mr. W. T. Gilboy, of 99, Coldharbour Lane, Camberwell, writes that—"Whilst outward bound to Montreal, about 1000 miles from land, I captured a fine specimen of the Death's Head Hawk Moth."—N. D. R.

AN UNUSUAL VARIETY OF CHÆROCAMPA ELPENOR.—I recently had the opportunity of examining a somewhat unusual variety of *Ch. elpenor* bred by Mr. C. H. Hards from a larva of the green form, taken in August, 1910, at E. Farleigh, Kent. It is remarkable in that the areas usually green are chocolate-coloured, the normal pink areas are pale dirty brown, and the basal and hind marginal areas of the hind wing are a darker dirty brown. Unfortunately, owing to neglect during the war, the specimen is in rather poor condition. Two apparently similar specimens are recorded by Tutt in his British Lepidoptera.—N. D. R.

ABERRATIONS OF AGROTIS CORTICEA.—An extraordinary aberration of *A. corticea* was obtained in my moth trap on June 23rd last. It is a male in perfect condition. The antennæ and hind wings are normal. The centre of the fore wings is black without any markings, and on either side of this area the colouring is grey peppered with darker lines and marks. In a very strong light and at a certain angle it is *just* possible to make out the normal markings. I also obtained two other specimens leading up to this particular form. The first, a male, is a typical male except that the general colouring is darker. In the second, a female, the colouring is darker still, and although the markings can easily be distinguished, they have become somewhat blurred instead of standing out as they do in typical specimens owing to the lighter background.—FREDERICK GILLET (Major); Cheriton House, Sevenoaks, Kent.

MELANIC EUPITHECIA TRISIGNARIA.—I bred this year a single specimen of this species which is as pure black as *E. albipunctata* var. *angelicata*, and without markings except for the discoidal spot, which, as in *angelicata*, is of a more intense black. I am not aware that a pure melanic specimen of this species has hitherto been reported. One or two other specimens bred at the same time were darker than usual, but these are merely dark ordinary specimens and

* ♀ f. *helicina* Ob.

show all the usual markings.—H. C. HAYWARD, F.E.S.; Repton, October 18th, 1922.

SCARCITY OF *SPILOSOMA LUBRICIPEDA* AND *S. MENTHASTRI*.—I am much interested in the notes of Mr. Stowell and the Rev. J. E. Tarbot (Entom., pp. 231 and 257) on the growing scarcity of *Spilosoma lubricipeda*, because I had got a notion that the phenomenon was probably only occurring in the north of England. In my early collecting days, sixty or more years ago, *S. lubricipeda* abounded here in every garden and on every piece of waste land where docks grew luxuriantly, so much so that its larvæ were often a destructive pest. It gradually became scarcer, and is now practically non-existent. I do not remember to have seen a single larva for more than twenty years, and during that time not more than three moths in any one season, often two or one, sometimes none. This year I have seen one example only. Nor am I at all sure that the few specimens seen were bred here, as they have usually occurred on the road-sides just outside the town, probably attracted by the gas or electric lights, and may easily have been brought here on railway waggons. I never see one in my own or other people's gardens. *S. menthastri* used to be almost as abundant on the field sides, but it, too, has almost disappeared, though more recently than *lubricipeda*. Odd moths are still occasionally to be seen on the country walls, or a larva now and then crossing the road, seeking a place in which to spin up, but I have not seen even one of either this year.—GEO. T. PORRITT; Elm Lea, Dalton, Huddersfield, November 3rd, 1922.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*, ETC.—I have worked "light" consistently during the past three seasons and found this insect quite scarce during 1920 and 1921, first appearing on June 20th, 1920, and May 24th, 1921. During 1922, however, it was quite common, appearing on May 30th (nine days after *S. menthastri*) and being about half as common as *menthastri*. *Agrotis nigra*, which was common at sugar in 1921, never appeared at all in 1922. *Lobophora carpinata*—always less common here than *L. polycommata*—failed to turn up this year. *Ligdia adustata* was unusually abundant from May 18th, being quite a pest.—Dr. R. LOWTHER; Fernleigh, Grange-over-Sands, N. Lanes, November 15th, 1922.

SPILOSOMA LUBRICIPEDA AND SEASONAL NOTES.—With regard to the scarcity of this species, I have not seen it at all in this district this year and only took one specimen last year. Larvæ are very late in pupating this season. I have a half-grown larva of *Smerinthus populi* still feeding, and the last of some birch-feeding Geometer larvæ obtained by beating in early October only went down on November 9th.—G. V. BULL, M.B.; Montagu House, Hoddesdon, Herts.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*.—I took two of these insects in 1919 and have not seen one since. It used to be very common here.—FRED F. WOOD; Eastons, Ditchling, Sussex.

SCARCITY OF *SPILOSOMA LUBRICIPEDA*.—I took a small batch of newly hatched larvæ of this species this last summer on red currant

bushes in my garden here. I have always found *lubricipeda* by far the most common of the ermine moths in Notts and Lincolnshire where I have collected this last fifteen years.—A. R. F. P. WYNNE; Upton, Southwell, Notts.

ZYGÆNIDÆ ATTRACTED BY LASIOCAMPA QUERCUS ♀, ETC.—During a recent holiday on the South Devon coast I had the pleasure of taking *Colias croceus* var. *helice*, *Herse convolvuli*, *Leucania vitellina* and *L. unipuncta* on September 1st, 2nd, 4th and 6th respectively, the two last at sugar in spite of an exceedingly bad spell of sugaring. *L. unipuncta* was apparently newly emerged. Of greater interest; almost, was the finding on a sugar-patch of a female *Noctua c-nigrum* in cop. with *N. xanthographa*. No ova were obtained, however. Assembling for *Lasiocampa quercus* produced some curious results. The female was besieged whenever I put her down by swarms of *Zygaena filipendulæ*, which would remain in the box until removed. This happened over a very wide area, and she seemed more attractive to the *Zygaenidae* than to her own species, as only a few of these turned up.—G. P. SUTTON; 60, Oval Road, Erdington, Birmingham, October 26th, 1922.

CANNIBALISM AMONG CUCULLIA VERBASCI.—*Cucullia verbasci* larvæ are common on the Salisbury Downs, and I have often collected them. I have observed that when several are kept in a larva cage together their numbers invariably diminish even when a plentiful supply of food is at hand. Although I have never seen larvæ attack one another, I have little doubt that they are cannibals.—A. STEVEN CORBET; Reading.

KILLING WITH CYANIDE.—Respecting Mr. Frank Littlewood's note in November number, p. 260, on the use of cyanide for the purpose of relaxation, I may point out the fact that certain species, especially *G. rhamni* and both *C. edusa* and *C. hyale*, are very liable to become blotched with crimson and otherwise discoloured, and if left for any considerable time in the cyanide bottle only a small proportion of their original colour will remain.—F. W. FROHAWK.

DESTRUCTION OF PAPILIO MACHAON LARVÆ BY CUCKOOS.—It is generally supposed that brightly coloured larvæ are immune from the attacks of birds owing to such ornamentation acting as a protective colouring, and as a rule certain species possessing the so-called warning colours are undoubtedly distasteful to birds—for instance, I know of no bird which feeds on the larva of *Pieris brassicae*, which, although not brilliantly coloured, is nevertheless a conspicuous object. I have often watched several species of birds such as garden warblers, willow warblers, wrens, robins, hedge-sparrows and blue tits, all busily engaged in searching beds of cabbages for the larvæ of *P. rapæ*, which they manage readily to detect although their colouring harmonises perfectly with the colour of the leaves, and greedily devouring them, but I have never seen any bird attempt to eat the larva of *P. brassicae*, which are passed unnoticed by all birds, although they are among the most conspicuous larvæ in their manner of living fully exposed on both surfaces of the leaves. Whether *brassicae* larvæ are eaten by the

cuckoo I have failed to determine; certainly those of which I have examined the stomachs have contained no trace of these larvæ. Unfortunately the handsome and richly ornamented larva of *Papilio machaon* is a favourite diet of the cuckoo (although it might be considered distasteful owing to its brilliant colouring, and the forked retractile tubercles emitting a strong acrid scent which are protruded when the larva is irritated) according to the facts stated by the late Mr. Fergus M. Ogilvie, who was one of the most skilled and accurate of field naturalists. I therefore think it may be of general interest to other entomologists to quote the following observations made in Norfolk and recorded by him. I omit the precise locality for obvious reasons. Mr. Ogilvie states—"One young cuckoo, obtained July 27th, contained a considerable number of the larvæ of the swallow-tailed butterfly. . . . Cuckoos are exceeding plentiful here. They are distributed in greater numbers over the Broad district than in any other locality with which I am acquainted. . . . I have little doubt that the cuckoo of the Broad lays a heavy toll on the swallow-tailed larvæ when they are in season. It may well be that the progressive diminution of this—our handsomest British butterfly—is in some measure due to the quantity of cuckoos in the district and their insatiable appetites."

It might be argued that as both the cuckoo and *machaon* have been in existence for ages, these butterflies would in course of time have long since ceased to exist where cuckoos abounded, but when we know that birds sometimes gradually acquire a liking for a new diet, which naturally becomes an inherited habit, such may possibly be the cause for the now prevailing fondness of cuckoos for *machaon* larvæ, and if such is the case this fine insect may finally disappear from its British haunts.—F. W. FROHAWK.

HENRI FABRE AND THE MICROGASTER.—With regard to the Rev. G. W. Crutchley's article under the above title in last month's Entomologist, I know the account of the oviposition of *Apanteles glomeratus* by Fabre quite well, and years ago, when his book was first translated into English, had intended writing a note on the subject. I fear the celebrated Frenchman was sadly astray in this case and may have confused some egg-parasite (a Chalcid or a Proctotrupid) with the Braconid. On more than one occasion I have witnessed the imagines of *A. glomeratus* ovipositing on larvæ of *Pieris brassicae*, and the process is as described by Mr. Crutchley. The sudden and repeated attacks and the jerk given by the host to dislodge the parasite I can confirm. I must admit, however, that I have never noticed the attackers to be drenched by the green fluid which exudes from the mouths of the caterpillars; indeed Mr. Crutchley appears to prove that if this fluid is deliberately squirted at the parasite, which I am rather inclined to doubt, it is far from being a satisfactory method of defence.—G. T. LYLE; Briarfield, Shibden, nr. Halifax.

AN UNCOMMON ANT.—Very little literature appears to exist concerning the life-history and habits of *Stenamma westwoodi* Steph. This small ant—a member of the sub-family Myrmicinae—is chiefly described as being taken in small numbers in the nests of other ants,

and, indeed, was considered by many earlier writers to occur only in such situations. However, it seems that such occurrences must be entirely accidental, as it has been my good fortune to discover a locality in North London in which nests of this ant are by no means rare. A damp wooded spot with a clay subsoil covered in moss seems to provide ideal conditions. The colonies are usually situated at the foot of a tree, preferably a few inches from the trunk, on the western side. There is no external indication of the nest, which consists merely of a small hollow, never more than an inch below the surface in summer. This cavity has only one small aperture, through which ants engaged in foraging are able to gain the surface of the soil, where, however, they take every advantage of cover provided by dead leaves, etc., rarely appearing in the open and never straying far from the nest. The colonies are never very populous, about 200 workers being the maximum number that I have found. Some forty workers and one dealated female constitutes a typical colony, but in July last I found one nest containing no less than six dealated females and only seventeen workers. The winged forms do not appear until the end of August and remain in the nests until quite late in the year. I still have both sexes in my observation nests (November 1st). The food apparently consists entirely of small insects and other animal matter. I cannot induce them to touch honey or other sweet materials. Eggs and larvæ are present all the year round. The larvæ particularly are interesting. The body is much more globular than is usual in ant larvæ, and the head is mounted on a somewhat lengthy neck—in fact the whole thing is very like a retort in shape. When a dead insect—for example, a Culicid—is brought in, it is cut up and the pieces piled among the larvæ, which proceed to devour them, their mobile necks giving them a considerable range of movement. The only Myrmecophile that I have found in the nests is *Cyphodeirus albinus* Nicolet, belonging to the Collembola.—WM. E. H. HODSON; Harley Lodge, Enfield, November 1st, 1922.

BUTTERFLIES ATTRACTED TO HUMAN PERSPIRATION.—The names of the butterflies referred to in my note on the above (*ante*, p. 212) can now be supplied. They are—Lycænidæ: *Lycaenesthes ligures* Hew., *Hypolycaena antifaunus* Dbl. & Hew., *Catochrysops malathana* Bois. Acraeinæ: *Acraea peneleos* Ward., subsp. *pelasgius* Gr. Sm.—N. C. E. MILLAR; 90, Alley Road, Dulwich, S.E.

RECENT LITERATURE.

The Genitalia of the Tortricidae. By F. N. PIERCE and The Rev. J. W. METCALFE. Pp. 101. 34 plates.

The joint authors of this very valuable work are to be congratulated on the successful completion of their task of working out the genitalia of this important division of the Lepidoptera.

The volume is of course another instalment of Mr. Pierce's gigantic life-work on the genitalia of the whole of the British Lepidoptera.

The author has had it in preparation for many years, and we gather that it would have been issued in 1917 but for the Great War.

The whole of the slides and letterpress are the work of Mr. Pierce; the plates, very excellent ones, are from the drawings of Mr. Metcalfe.

In previous volumes the genitalia were drawn to scale, but in the case of the Tortricidæ this process would have so reduced the figures of the smaller species their value would have been greatly lost; the drawings have therefore in this instance been kept of a fairly uniform size, so that the different and characteristic points in even the smallest species might be shown.

In the arrangements of the drawings on the plates the male organs are on the right, those of the female on the left. This will no doubt be apparent to most students, but in each future volume it might be better to give a short explanation as to the precise meaning of the various figures.

The author has gone a step further than in previous volumes, and has introduced a scheme of classification based upon the characters of the genitalia only.

This method is interesting, because it shows the relations of the various species to each other from the point of view of these organs; but it produces some strange bedfellows, and widely separates species that have in the past considered themselves nearly related, and that will in all probability continue to be regarded as such in the future. The author, however, admits that the final classification must be based upon a study of all the characters—a view with which we certainly agree.

Mr. Pierce states that the most arresting result of his study of the genitalia of the Tortricidæ is the way the species fall into clearly defined groups, and that it is possible at once to place a species in the group to which it belongs; but that these organs shed very little light on the historic relationship of the groups. He considers that with respect to position there is a connecting link with the *Geometridæ* where the characteristic hinged and much curved penis of the *Tortricidæ* appears in the *Chesiadiniæ*, notably in the case of *Anaitis plagiata* and in *Odezia atrata*. When we come to specific differences, these, although constant, are sometimes extremely small, yet within a group it is possible to secure a perfectly natural sequence.

In classifying in accordance with the characteristics of the genitalia, the author has worked out the genera with the aid of Fernald's *Genera of the Tortricidæ and their Types*; he does not, however, create new names for genera or types in instances in which he has been unable to trace any generic name, but has left blank spaces, in order to avoid creating superfluous names for genera which may already exist; he is to be thanked and congratulated on this decision.

Mr. Pierce states that in the course of the investigations of Mr. Metcalfe and himself they have added six new species to the British List, though we think there is a doubt if all of these will permanently stand. On the other hand he cannot find any difference in the genitalia between no less than five pairs of species at present, generally regarded as distinct, and with good reason in the majority

of cases. In a few species the genitalia appear to be in a plastic condition, and considerable variations are found, such as in the case of *Epiblema pflugiana*, which is apparently divided into several distinct forms, but the genitalia give no constant character by which to separate them.

On looking through the lists of species certain points strike us. We should have liked to see more synonymy in some cases. On p. 10, for instance, *Cnephasia incertana* Tr. appears without its perhaps better-known synonym, *C. subjectana* Gn.; on p. 11 *C. longana* Haw. is similarly treated, without reference to its other name, *C. ictericana* Haw. There are several other instances in which we should have been glad to have the old, better-known names indicated.

On p. xxi of the introduction we are told that the author cannot distinguish between the genitalia of *Argyroploce carbonana* and *A. nigricostana*, but on p. 46 we see *A. carbonana* Dbl.=*ustulana* Haw.=*fuligana* Barrett, and on p. 47 that it is the *A. fuligana* of Hubner of which the synonym is *carbonana* Barrett, which has genitalia not distinguishable from *A. nigricostana* Haw.

The book is one all students of the Order, and all philosophic entomologists, should possess; and we trust for the sake of the author who has produced it in these very expensive times, for pure love of science, that everyone who can possibly afford the cost will take a copy. It is to be obtained from Mr. F. N. Pierce, The Old Rectory, Warmington, Northants; and the price to subscribers, including postage, is 15s. 6d. per copy.

W. G. S.

In Bulletin, No. 1 (Technical Section) of the Sultanic Agricultural Society, Cairo, pp. 12, 13, (1922), Mr. F. C. Willcocks gives a table of results of some moth-trap experiments using different coloured lights. Assuming all the lamps to have been used an equal number of times, the numbers of moths caught were: at blue light, 335; white, 297; green, 67; orange, 38; red, 37. In view of recent discussions in this magazine it is interesting to note that blue light was more attractive than white. The experiments were in connection with economic work, and a fuller report is promised later.

N. D. R.

SEITZ, *Macrolepidoptera of the World*, publication of which was interrupted to some extent by the war, appears now to be on a sound footing again. The Palearctic Division is complete and the Rhopalocera volumes at least of the other Division are going on well. In the German edition the Hesperidæ have been reached in the American, the Lycenidæ in the Indo-Australian and African sections. With the moths matters are unfortunately not so advanced, but progress is certainly being made. The English edition naturally lags behind the German to some extent, but is gradually overtaking the arrears. Herren Seitz and Kernén are to be congratulated on the success which is attending their determined efforts to overcome the many difficulties with which violently altered circumstances have surrounded their undertaking. At the present rate another year or two should see the welcome conclusion of this very valuable work.

N. D. R.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF HAMPSHIRE.—A Hampshire County List of Lepidoptera is in course of preparation. It is hoped that all entomologists who can help will do so by sending lists, especially of the Microlepidoptera, to Mr. W. FASSNIDGE, 47, Tennyson Road, Southampton.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 4th, 1922.—Mr. Robert Adkin, Vice-President, in the Chair.—*Obituary* :—The deaths of the following Fellows were announced and a vote of condolence with their relatives was passed: Dr. David Sharp, F.R.S., one of the special Life Fellows of the Society; Mr. Hamilton H. Druce; Mr. Arthur Horne; Mr. Frank M. Littler; and Mr. G. O. Sloper.—*The Collection of Portraits* : The Treasurer made a statement as to four new portraits that had recently been hung in the Meeting Room, and a portrait of the late Dr. Sharp, presented by Mr. W. J. Lucas, for addition to the collection, was gratefully accepted.—*Election of Fellows* :—The following were elected Fellows of the Society: Messrs. Guy Babault, 10, Rue Camille-Perier, Chaton, Seine-et-Oise, France; Albert E. Waight, Brunleigh, Kent Bank Road, Grange-over-Sands. *Exhibits* : Mr. W. G. Sheldon exhibited some moths from the Farn Collection, including the rare type form of *Sarrothripus revayana* Scop., as well as ab. *ramosana* Hb., and ab. *degenerana* Hb., also *Acrobasis tumidana* Schiff., and *A. zelleri* Rag.—Professor Poulton, F.R.S., exhibited and made remarks on a living example of *Polygonia c-album*.—Mr. Arthur Dicksee exhibited some rare butterflies from Ecuador.—Dr. F. A. Dixey, F.R.S., commented on some recent observations he had made on the scent of butterflies, chiefly Pierines.—Mr. H. Donisthorpe exhibited specimens of *Aulonium ruficorne* Ol., and *Hypophloeus fraxini* Kug, two beetles new to the British list taken in the Forest of Dean.

October 18th, 1922.—Professor E. B. Poulton, D.Sc., M.A., F.R.S., etc., Vice-President, in the Chair.—*Election of Fellows* : The following were elected Fellows of the Society: Messrs. S. Stuart Light, Redcot, Linton Road, Hastings; G. H. E. Hopkins, Downing College, Cambridge; V. G. L. van Someren, C.M.Z.S., etc., Nairobi, Kenya Colony. —*Exhibitions* : Mr. Donisthorpe exhibited a series of both sexes of *Leptura rubra* taken in Norfolk.—Dr. K. Jordan, F.R.S., exhibited some Notodontid Moths the males of which have a remarkable organ on the side of the abdomen. The function of this seems to be to transmit scent from the abdomen to the hairy hind tibia and hind wing.—Professor E. B. Poulton read a communication from Dr. R. C. L. Perkins, F.R.S., on seasonal changes in the colours of the female of *A. bellargus*, and exhibited specimens of males of *Papilio dardannus* from Kibwezi, Kenya Colony, in which the colouring of the hind wing was of the western pattern. He also exhibited a living and healthy larva of *Abraxas grossulariata*, the only survivor of a fifth inbred generation that had been sleeved out on *Prunus pissardii* as long ago as the 21st July, 1921.—*Papers* :—The following papers were read: On Schmit-Goebel's Types of Carabidæ, by Mr. H. E.

Andrewes; On the Larva and Pupa of *Sabatinca*, by R. J. Tillyard; On Endomychid Coleoptera, by Mr. G. J. Arrow; On the Biology of some British Neuroptera, by Mr. C. L. Withycombe; On the Rhopalocera of the 1921 Mt. Everest Expedition, by Mr. N. D. Riley.

November 1st, 1922.—Professor E. B. Poulton, D.Sc., M.A., F.R.S., etc., Vice-President, in the Chair.—*Election of Fellows*: The following were elected Fellows of the Society: Messrs. A. N. Burns, Salisbury Road, Rose Bay, Sydney, New South Wales; R. T. Daubeney, B.A., Herne Vicarage, Herne, Kent; C. C. Ghosh, B.A., Agricultural College, Mandalay, Burma; L. G. Higgins, M.A., F.R.C.S., Heather-side, Woking, Surrey; J. F. Marshall, M.A., Seacourt, Hayling Island; A. E. Moore, Brookside, Brent Mead Avenue, Golders Green, N.W.; A. Musgrave, Australian Museum, Sydney, New South Wales; Miss E. K. Pearce, Kempston, Bournemouth West; Messrs. E. Piazza, 4734, 48th Street, San Diego, California, U.S.A.; J. Price, 165, Corporation Street, Stafford; the Rev. W. H. Richardson, 32, Wanderers' Avenue, Wolverhampton; Messrs. A. H. Ruston, Aylesbury House, Chatteris, Cambs; F. E. Wilson, Jacana, Darling Road, East Malvern, Melbourne; and H. E. Winsor, 2, Mead Road, Cranleigh, Surrey.—*Gift to the Society*: The Treasurer announced that he had received £500 towards the Housing Fund from the Misses Chapman on behalf of their brother, the late Dr. T. A. Chapman, F.R.S.—*Exhibitions*: Dr. F. A. Dixey, F.R.S. exhibited specimens and drawings of the genitalia and scent-scales of *Belenois gidica*, Godt., with those of some other species of *Belenois* for comparison.—Dr. K. Jordan, F.R.S. described the tympanal organ of *Speiredonia*, and discussed the development of this organ in the Noctuidæ.—Dr. Eltringham gave some account of similar organs in Geometrids.—Dr. E. A. Cockayne exhibited an example of Homœosis in *Coenonympha pamphilus* L.—Mr. J. E. Collin exhibited an intersex of *Mydaea duplicata*.—Professor E. B. Poulton, F.R.S., exhibited on behalf of Mr. E. N. Willmer living larvæ of a Nemopterid from the Egyptian desert, and Mr. E. E. Green and Dr. Imms described the habits of a similar species from India and Ceylon.—S. A. NEAVE, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*October 12th, 1922.*—Mr. E. J. Bunnett, M.A., F.E.S., President, in the Chair.—Mr. Stanley Edwards exhibited the fungus *Clavaria crispula*, from Blackheath.—Mr. Hy. J. Turner, a photograph, by Mr. Step, of *Clavaria pistillaris*, a rare fungus found on Rannmore Common and Norbury Park.—Mr. Withycombe, a queen hornet, *Vespa crabro*, caught when flying over a tramcar at Walthamstow.—Mr. H. Main, recently hatched young of the slug, *Arion ater*, the larvæ of the glow-worm *Lampyrus lusitanica*, a wolf spider, found under stones, closely allied to Fabre's *Lycosa narbonensis*, and a black scorpion abundant at Pont du Gard.—Mr. Step, a small snake, *Tropidonotus viverrinus*, from the Pont du Gard, sent him by Mr. Main.—Mr. Blenkarn, the Coleopteron *Magdalis carbonaria* from Mickleham, not hitherto taken south of Sherwood Forest, and *Rhynchites pubescens*, which was not uncommon at Westerham in June.—Mr. L. W. Newman, a painting of an aberration of *Agriades coridon* ♂ from

Royston, with various streaks of ♀ coloration, and an extremely pale *Epinephele jurtina* from the Chilterns.—Lantern-slides were shown by Mr. H. Main, of the economy of the scorpion, of *Microdon* sp. (Dip.) a scavenger in ants' nests, and of the early stages of *Cetonia aurata*; by Mr. Dods, of a series of plants; by Mr. Lucas, of points in the life-history of *Raphidia notata*, *R. maculicollis*, *Chrysopa perla* and *Hemerobius*; and by Mr. Bunnett, the development of the fungi *Mutinus caninus* and *Phallus impudicus*, the fungus *Geaster* sp., and ova and young larvæ of the woodlouse, *Porcellis scaber*.

October 26th, 1922.—The President in the Chair.—Mr. F. T. Vallins, 372, Sherrard Rd., E. 12, was elected a member.—Mr. R. Adkin exhibited his series of *Diaphora mendica* with its various local races, etc.—Messrs. O. R. and A. de B. Goodman, both sexes of *Pieris rapae* and *P. manni* for comparison, *P. napi* of the extreme summer form *napaeae*, approaching *P. manni* in facies, and a *P. napi* with a spot near the apex strongly formed.—Miss Alice Lock, *Herse convolvuli* and a ♀ *Colias croceus* (*edusa*) intermediate to v. *helice*, both from Sidmouth in September.—Mr. A. A. W. Buckstone, a large sample of 500 *Pyrameis cardui* bred from Oxshott parents, pointing out specimens (1) with pale blotch in centre of fore wing, (2) with blue centres to spots on hind wings, (3) with pink nervure running through the white blotch, etc.—Mr. Blair, the ant *Myrmecophila acervorum* from S. France.—Mr. Main, flour infested with the beetle *Tribolium ferrugineum*.—Mr. Mera, a series of *D. mendica*, including a dwarf smoky female.—Mr. Enefer, the roots of the bean, pointing out the nodules which are concerned in the formation of nitrogenous compounds, which enrich the soil for the growth of crops.—Mr. Tonge, his series of *D. mendica*.—Mr. R. Adkin read a paper, *Diaphara mendica* and its varieties. A short discussion took place.—Hy. J. TURNER, *Hon. Editor of Proceedings*.

LONDON NATURAL HISTORY SOCIETY.—November 7th, 1922.—Mr. E. B. Bishop, President, in the Chair.—Among the entomological exhibits were specimens of *Hyloicus pinastri* and a living larva of *Colias croceus* (Dr. Cockayne), a collection of butterflies from Java (Mr. Collenette), examples of the second brood of *Lycaena argiolus* showing darker coloration (Mr. A. W. Mera), *Brenthis euphrosyne* selected from a number taken last May showing variation, and a pallid variety of *Hippocrita jacobaeae* (Mr. H. B. Williams), *Dicycla oo* (Mr. Worsley Wood), a case of Swiss butterflies (Mr. C. B. Smith), and galls of *Andricus Malpighii* on *Quercus pedunculata* (Mr. Ross), *Callirhytis glandium* on *Quercus cerris* and *Adelges piceae* on *Abies* sp. Paper read—A Pilgrimage in Provence, by Mr. H. Main, illustrated by his own splendid slides and living specimens of some of the creatures described.—H. J. BURKILL, *Minuting Secretary*.

OBITUARY.

ARTHUR HORNE.

As announced last month, Arthur Horne has passed away. He had been for some time suffering from a very grave illness, and although several operations afforded temporary relief, the inevitable end came on September 25th last.

The subject of this notice was the son of the late Mr. Arthur Horne, of Longside, Aberdeenshire, where he was born on October 16th, 1864; he was thus in the fifty-eighth year of his age at the date of death. An excellent business man, he rose from small beginnings to a position of affluence. He was the founder and principal partner of "Hornes Limited," one of the chief commercial houses in Aberdeen.

Ever since his boyhood Mr. Horne has been one of the best known of Scotch Lepidopterists, and although he contributed little to the literature of the science, he was an excellent practical Lepidopterist and field worker, and undoubtedly knew more of the Highland species than anyone now living. He was also well known as an ornithologist and horticulturist. Mr. Horne was a familiar figure at the sales of British Lepidoptera held at Stevens's Rooms from time to time, but, although he would not grudge paying £15 or £20 for a choice aberration, his judgment and sense were excellent; he was not one of those men who *must* have a coveted specimen no matter what the price might run to! Although he had been seriously ill for many months, almost to the end he continued to take a keen interest in his loved science. He was elected a Fellow of the Entomological Society in 1897.

A typical Aberdonian, Mr. Horne was shrewd to a degree, a man of his word, absolutely upright in all his actions, good natured, full of humour, and with much personal magnetism; he was liked and respected by all he came into contact with, and his early decease is deeply to be regretted. He was one of the, also too few, Lepidopterists who appreciated and possessed a fine library, practically every book that could assist his studies being included in it. His collection of British Lepidoptera, one of the very finest in the country, it is understood will be disposed of, the library being bequeathed to his son Eustace, who shows marked signs of a desire to follow in his father's steps as an Entomologist. We trust he will carry on.

Mr. Horne was twice married, and leaves a widow and several children, to whom we desire to express our deep sympathy in the heavy loss they have sustained.

W. G. S.

WE very much regret to have to record the death of Mr. G. ORBY SLOPER on September 22nd last.

Also with very great regret we record the death of Mr. H. J. ELWES on Sunday, November 26th, at Colesborne, Gloucestershire.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused.] *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21ST OF EACH MONTH to insure insertion. Not more than **SIX LINES** can be allowed for each.

Duplicates.—Fine, well set. *Immutata*, *Lichenaria*,* *Heparata*, *Emarginata*, *Affinitata*, *Rubidata*, *Ornata*, *Candidata*, *Promutata*, *Taminata*, *Bimaculata*, *Temerata*, *Strigellaria*,* and many others. *Desiderata.*—Many common species for renewals; perfect condition only.—*Wm. Barraclough, Hall Hall, Low Moor, Bradford.*

Wanted.—Pupæ of *Strataria*, *Betularia*, *Furcula*, *Bicuspis*. *Duplicates.*—*Nocturnæ*; or will pay cash.—*W. Bowater, 23, Highfield Road, Edgbaston, Birmingham.*

Duplicates.—*Pendularia* var. *nigro-subroseata* (strain lost last year), a few fine examples. *Desiderata.*—Var. *Helice*, *Ocularis*, *Impar*, *Ulvæ* vars., *Cannæ*, *Connexa*, *Simulans*, *Alpina*, *Xanthomista*, *Atriplicis*, *Orichalcea*, *Semibrunnea*, *C. reticulata* and butterfly vars.—*R. T. Bowman, 17, Frederica Road, Chingford, London, E. 4.*

Duplicates.—*Aurinia*,* *Io*,* *T. rubi*, *Flavicornis*, *Rumicis*,* *Typica*,* *Fulvago*,* *Flavago*,* *Chli* and var., *Protea*, *Umbratica*, *Pedaria* and var., *Punctularia*, *Vauaria*,* *Marginata*, *Tristata*, *Designata*, *H. cespitalis*, *E. cingulata*, *P. sponsana*, *P. comparana*, *P. ferrugana*, *A. conwayana*, *G. penkleriana*, etc. *Desiderata.*—Pupæ and imagines of many species.—*G. Fleming, 26, West Grove, Merthyr Tydfil.*

Duplicates.—*Salmacis* (6), *Captiuncula*, *Innotata* (3), *D. salicella*,* *Congelata*, *Ochrodactyla*,* *Rusticana*, *Dorsana*, *Uncana*, *Variegana* (white var.), *Vacciniana*, *Schulziana*, *Strobilella*,* *Nanana*, *Sauciana*, *Occultana*, *Bimaculana* (4), *Badiana*,* *Baumanniana*, *Incarnatana* (4), *Corticella*, *D. nervosa*,* etc. *Desiderata.*—Good *Peronea* vars., *Penzionia*, *Colquhouniana*, good *Pyræles*, *Tortrices*, etc.—*T. Ashton Lofthouse, "The Croft," Listhorpe, Middlesbrough.*

Desiderata.—*Bombyliiformis*, *Sesiidæ*, *Ligniperda*, *Bifida*, *Quercifolia* and many *Bombyces* and *Nocturnæ*, etc. *Duplicates.*—Many good *Geometers*. Lists exchanged.—*Thomas Smith, Whiston Eaves, Froghall, Stoke-on-Trent.*

Duplicates.—*Aglaia*, *Adippe*, *Paphia*, *Sibylla*, *Galatea*, *T. rubi*, *Ægon*, *Argiolus*, *Corydon*, *Fuciformis*, *Mesomella*, *Monacha*, *Dersa*, *Batis*, *L. comma*, *Lithoxylea*, *Hepatica*, *Straminea*, *Herbida*, *Nebulosa* (very light), *Thalassina*, *Fuscula*, *Promissa*, *Advenaria*, *Syringaria*, *Autumnaria*,* *Glabraria*, *Extersaria*, *Lactearia*, *Viretata*, *Populata*, etc., etc. *Desiderata.*—*Salmacis*, *Clearwings*, *Quercana*, *Unguicula*, *Fluctuosa*, *Scolopocina*, *Depuncta*, *Oo*, *Bractea*, *Vennustula*, *Sparsata*, and many others to replace. Only fine specimens offered and wanted.—*William C. Wells, 354, Boldmere Road, Erdington, near Birmingham.*

Duplicates.—*Croceus* ♂ and ♀ (bred), *Lucina*, *Corydon*, *Bellargus*, *Galatea*, *Polychloros* (bred), etc.; *Convolvuli* (one only, fair). *Wanted.*—*Epiphron*, *Æthiops*, *Typhon* and other butterflies only. Correspondence invited.—*C. M. Woodford, "The Grinstead," Partridge Green, Sussex.*

Duplicates.—*C. croceus* (*Edusa*), *C. ambigua*. *Desiderata.*—Numerous, especially *C. quadripunctaria* (*Hera*), *Dominula*, *A. villica* and *H. convolvuli*.—*G. W. Wynn, "Rosemary," Hampton-in-Arden, Warwickshire.*

CHANGES OF ADDRESS.—*Hugh Percy Jones* from "Eastlands," Lynnington, to "The Briars," Brockenhurst.—*R. Stanway Parris, I.D.S., R.C.S.,* from Beachleigh, Kingsgate, Kent, to "The Gables," Sandhurst, Berkshire.

TO CORRESPONDENTS.—All notes and papers intended for publication, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

CONTENTS.

EDITORIAL, 265.

The Present Values of the Principal Works on the Palearctic Lepidoptera, *W. G. Sheldon, F.Z.S., F.E.S. (continued from p. 244), 265.* A New Genus and Species of Micro-lepidoptera from New Zealand, *E. Meyrick, B.A., F.R.S., 270.* Records from a South Hampshire Lepidopterist's Log-book for 1920, *A. T. Postans, (continued from p. 254), 271.* Light Trap Experiments in connection with Temperature, etc., *Major Frederick Gillett, 274.*

NOTES AND OBSERVATIONS.—*Euchloë cardamines* at Chichester in September, *Joseph Anderson, 277.* *Colias croceus* ab. *failla* and *Herse convolvuli* in Lincolnshire, *G. T. Pigott (Major), 277.* *Colias croceus* at Plymouth, *C. W. Bracken, B.A., F.E.S., 277.* *Herse convolvuli* at Bedford, *W. Gifford Nash, 278.* *Daphnis nerii* off Scotland, *L. G. Esson, 278.* *Acherontia atropos* at Sea, *N. D. R., 278.* An Unusual Variety of *Chærocampa elpenor*, *N. D. R., 278.* Aberrations of *Agrotis corticea*, *Frederick Gillett (Major), 278.* *Melanio Eupithecia trisignaria*, *H. C. Hayward, F.E.S., 278.* Scarcity of *Spilosoma lubricipeda* and *S. menthastri*, *Geo. T. Porritt, 279.* Scarcity of *Spilosoma lubricipeda*, etc., *Dr. E. Louthier, 279.* *Spilosoma lubricipeda* and Seasonal Notes, *G. V. Bull, M.B., 279.* Scarcity of *Spilosoma lubricipeda*, *Fred. F. Wood, 279.* Scarcity of *Spilosoma lubricipeda*, *A. R. F. P. Wynne, 279.* *Zygænidæ* attracted by *Lasiocampa quercus* ♀, etc., *G. P. Sutton, 280.* Cannibalism among *Cucullia verbasci*, *A. Steven Corbet, 280.* Killing with Cyanide, *F. W. Frohawk, 280.* Destruction of *Papilio machaon* Larvæ by Cuckoos, *F. W. Frohawk, 280.* Henri Fabre and the *Microgaster*, *G. T. Lyle, 281.* An Uncommon Ant, *Wm. E. H. Hodson, 281.* Butterflies attracted to Human Perspiration, *N. C. E. Millar, 282.*

RECENT LITERATURE.—The Genitalia of the Tortricidæ, 282. Seitz' Macrolepidoptera of the World, 284.

SOCIETIES.—Entomological Society of Hampshire, 285. Entomological Society of London, 285. The South London Entomological Society, 286. London Natural History Society, 287.

OBITUARY, 288.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*Wednesday, December 6th, at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, December 14th, at 7 p.m., Ordinary Meeting.* Paper, "Notes on Zygænidæ," by T. H. L. Grosvenor, F.E.S.—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 15, St. German's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first Tuesday in each month, and sectional meetings on the third Tuesday. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG, The House, Albion Brewery, Whitechapel Road, E. 1.*

Great Reduction in Prices.

Cabinets.

Hardwood, finished rich mahogany, panelled or glass doors.
Drawers, 17 x 16 x 2½ in., on hidden runners.
Lift-off glazed tops, camphor cells, lined cork or pent.

40-drawer, 12/6 per drawer. 20-drawer, 1/- per drawer extra.

Store Boxes.

10x6in.	13x9in.	14x10in.	16x11in.	17x12in.
3/11.	5/-.	6/6.	7/9.	9/-.

G. A. BENTALL, 392, Strand, London, W.C. 2.

G. A. BENTALL

Naturalist

392, STRAND, LONDON, W.C. 2.

Entomological Supplies of all kinds.

SECTIONAL ENTOMOLOGICAL CABINETS.

A new departure in Entomological Cabinets now being manufactured and sold in **Sections** at the undermentioned greatly reduced prices. The **Top** and **Base Fittings** are purchased separately. Locking device **10s.** extra per Section. A complete 4-Sectional Cabinet of 20 Drawers can be seen on the premises. Further particulars sent on application.

Prices of Five-Drawer Section

	Visible Parts Mahogany.	Solid Mahogany.
18" x 18" x 2"	£8 0 0	£9 0 0
18" x 18" x 2½"	£8 10 0	£10 0 0

Top Fitting, **£1 1 0**

Base Fitting, **18s. 6d.**

Albert H. Thompson, 54 Church Rd., Northwich
Butterflies Set from Papers in English or
Continental Styles.

Terms on Request.

STEVENS'S AUCTION ROOMS, Ltd.

PRELIMINARY NOTICE.

The first portion of the

Valuable Collection of BRITISH LEPIDOPTERA

Formed by the late A. B. FARN, Esq.,

Will be offered on Tuesday, February 14th, 1922.

38 KING STREET, COVENT GARDEN, LONDON, W.C. 2.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, January 12th*, Ordinary Meeting at 7 p.m. *Thursday, January 26th*, Annual Meeting at 7 p.m.—*Hon. Sec., STANLEY EDWARDS, F.L.S., etc.*, 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec., W. E. GLEGG*, The House, Albion Brewery, Whitechapel Road, E. 1.

TYPICAL FLIES

A Photographic Atlas. Second Series.

By E. K. PEARCE.

With 125 photographs. Royal 8vo. 15s net.

"The photographs are as good as any we have seen of this class of insect—a peculiarly difficult class to represent pictorially in any natural manner; the venation of the wings is well brought out wherever the banding or colouring of the wings does not obscure it, and there are excellent short notes as to habitat, larval habits, and so on under the pictures."

Nature on FIRST SERIES.

CAMBRIDGE UNIVERSITY PRESS, FETTER LANE, LONDON, E.C. 4: C. F. CLAY, MANAGER.

PRICE 7s. 6d.

POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ, HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies, first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

G. A. BENTALL

Naturalist

392, STRAND, LONDON, W.C. 2.

Entomological Supplies of all kinds.

SECTIONAL ENTOMOLOGICAL CABINETS.

A new departure in Entomological Cabinets now being manufactured and sold in **Sections** at the undermentioned greatly reduced prices. The **Top** and **Base Fittings** are purchased separately. Locking device **10s.** extra per Section. A complete 4-Sectional Cabinet of 20 Drawers can be seen on the premises. Further particulars sent on application.

Prices of Five-Drawer Section

	Visible Parts Mahogany.	Solid Mahogany.
18" x 18" x 2"	£8 0 0	£9 0 0
18" x 18" x 2½"	£8 10 0	£10 0 0

Top Fitting, **£1 1 0**

Base Fitting, **18s. 6d.**

STEVENS'S AUCTION ROOMS, Ltd.

38, KING STREET, COVENT GARDEN, W.C. 2.

Sale by Auction, Tuesday, February 14th, at 12.30.

On view day prior and morning of sale.

THE WELL-KNOWN AND IMPORTANT

COLLECTION OF BRITISH LEPIDOPTERA

formed by the late A. B. FARN, Esq.

The first portion of the above Collection, comprising the early Genera of the Butterflies to *Cœnonympha*, including many very rare species: *Daplidice* 7, *Lathonia* 18, *Antiopa* 11, *Iris* 50. Also long series of extraordinary varieties, many unique: An entirely black *Galatea*, magnificent series of *Paphia*, many richly blotched with black, velvety black *Valezina* and intermediate forms; silvery white *Adippe*, v. *charlotta* (the Queen of England Fritillary) 3, rayed and richly blotched *Euphrosyne* and *Selene*, remarkable *Artemis* and *Cinxia*, white *Cardui*, *C. album*, *Euphrosyne* 3, *Urticæ*, *Pamphilus*, *Janira* and *Tithonus*. Many curious and interesting asymmetrical, hermaphrodite, gynandromorphous and teratological specimens, mostly in the finest possible condition, and labelled with exact localities, carefully collected by the late Mr. Farn, or purchased from the more important sales (during nearly fifty years) that have been held in these Rooms.

Catalogues on application.

A further portion will be sold on March 14th.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

"RARE EXOTICS."

WATKINS & TULLETT offer from their extensive stock of Exotic Lepidoptera the following rarities at reasonable prices:

AMERICAN.

MORPHO ZEPHYRITIS.

- " eugenia.
- " hecuba (♂ and ♀).
- " metellus.
- " perseus.
- " rhetenor (♂ and ♀).
- " cassica.
- " adonis.
- " lympharis (♂ and ♀).
- " melaicheilus, etc.

AGRIAS lugens.

- " lugina.
- " claudia (♂ and ♀).
- " claudia sahlkei (♂ and ♀).
- " narcissus.

PREPONA praneste.

- " neorterpe, etc.

POLYGRAPHA cyanea.

CENOPHLEBIA archidona.

BATESIA hypoxantha.

CALLITHEA philotima.

- " optima (♂ and ♀).
- " depuiseti (♂ and ♀).
- " sapphira (♂ and ♀).

CASTNIA syphax.

- " cronida.
- " pallatinus.
- " melanolimbata.
- " quadrata.

PAPILIO inca.

- " mercedes.
- " columbus (♂ and ♀).
- " coelus.
- " paraensis (♂ and ♀).
- " homerus.
- " orthosilaus.
- " pausanias, etc.

INDO-AUSTRALIAN.

PAPILIO weiskei.

- " krishna (♂ and ♀).
- " karna (♂ and ♀).
- " elephenor.
- " parinda (♂ and ♀).
- " androcles.

PAPILIO humbloti.

- " raddei.
- " blumei, etc.
- ARMANDIA lidderdalei (♂ and ♀).
- COSCINOCERA hercules (♂ and ♀).

AFRICAN.

KALLIMA ansorgei.

MYLOTHRIS ruppelli.

TERACOLUS elgonensis.

TERACOLUS trimeris (♂ and ♀).

XANTHOPAN morgani (♂ and ♀), etc.

Price Lists on application to—

WATKINS & TULLETT, 2, Edward St. LONDON, W. 1.
Wardour St.

G. A. BENTALL,

Naturalist,

392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

**Books, Apparatus, Palæarctic, Indo-Australian,
African or American Lepidoptera,
also other Insect Orders.**

FOR SALE.

GENUINE LARGE COPPER

Slightly damaged. What offers?

Write—

WOOD, "Penry," St. Alban's Avenue, WEYBRIDGE, SURREY.

STEVENS'S AUCTION ROOMS, LTD.,

38, KING ST., COVENT GARDEN, LONDON, W.C. 2.

Tuesday, March 14th, at 12.30 p.m.

THE FARN COLLECTION.

The second portion of this well-known and valuable Collection, comprising part of the Satyridæ, the Lycaenidæ and Hesperidæ, including twelve Specimens of the extinct Large Copper Butterfly (*C. dispar*), grand series of Varieties of *Phleas*, *Alexis*, *Adonis*, *Corydon* and *Arion*; rare *Sphinges* and *Bombyces*, with fine varieties of *Caja*, *Villica*, *Plantaginis* and *Cribrum*; exceptionally long and varied series of *Noctuæ*: *Subrosea* 4 (extinct), *Strigosa* 33, *Exilis* 16, *Erythrocephala*, *Oo* 40, *Ocellaris* 40, *Gnaphali*, *Palustris* (taken by the late Mr. Farn); *Crambidæ* and *Phycidæ*; many hybrids and hermaphrodites. Also two Mahogany Cabinets, each of 36 drawers.

Mr. J. C. Stevens will sell the above by auction on Tuesday, March 14th.

On view day prior and morning of sale.

Catalogues on application.

STEVENS'S AUCTION ROOMS, Ltd.

Natural History Books.

Wednesday, March 15th, at 12.30.

THE valuable and important Library of Books relating to Natural History formed by the late Dr. CHAPMAN, F.R.S., including the Transactions and Proceedings of the Zoological Society, The Entomological Society, The Ray and Linnæan Societies, 'Genera Insectorum,' Long Series of the 'Entomologist's Record,' 'The Entomologist,' 'The Entomological Magazine' and 'The Zoologist,' together with Standard Works by Barrett, Curtis, Stainton, Swainson, Hewetson, Leech, Seitz, Verity and others.

On view day prior and morning of Sale. Catalogues on application to

38 KING STREET, COVENT GARDEN, LONDON, W.C. 2.

NOTICE OF REMOVAL.

WATKINS & TULLETT respectfully wish to advise their clients that they have recently removed from their former premises (2 Edward St.) to **19 REGENT ST.**, and take this opportunity of thanking their friends for past favours, at the same time extending a cordial welcome to them at their new premises. Furthermore, they will be happy to meet new friends interested in Entomology, with the assurance of personal attention to all enquiries.

WATKINS & TULLETT,

19 Regent Street, LONDON, S.W. 1.

FOR SALE.—Fine and perfect *Lucina*, *Cinxia*, *Plantaginis*, *Dominula*, *Monacha*, *Tritici*, *Gracilis*, *Munda*, *Autumnaria*, **2d.** each; *Vespertaria*, *Advenaria*, *Ocellatus*, *Villica*, **3d.** each; *Croceago*, *Syringaria*, *Dolabraria*, *Pudorina*, *Littoralis*, *Fibrosa*, **4d.** each; *Fuciformis*, *Putrescens*, *Lychnitis*, *Flavescens* var. *Straminea*, **6d.** each. Many spring pupæ. Orders booked for coming season.

A. J. SPILLER, CHINNOR, WALLINGFORD.

G. A. BENTALL,

Naturalist,

392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

**Palæarctic, Indo-Australian, African, American
Lepidoptera and other Insect Orders.
Apparatus and Books.**

STEVENS'S AUCTION ROOMS, LTD.,

(Established 1760),

38, KING ST., COVENT GARDEN, LONDON, W.C. 2.

Sale by Auction, Tuesday, April 4th, at 12.30 p.m.

THE FARN COLLECTION.

The remaining portion of the Collection of British Lepidoptera formed by the late A. B. Farn, Esq., comprising 14 Specimens of *C. dispar*, extensive and very varied series of Geometræ, Tortrices and Tineæ, and conclusion of the Noctuæ; also Pyrales, Psychidæ, and Pterophori, together with the valuable Mahogany Cabinets of 36, 20, 12 and two of 18 drawers in which the Collection is arranged.

Catalogues on application.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, **9/9**; 2,000, **12/9**; 3,000, **15/9**.
Locality and date only (2 lines): 1,000 labels, **9/-**; 2,000, **12/-**; 3,000, **15/-**.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*
1,000 labels, **12/-**; 2,000, **15/-**; 3,000, **18/-**.

Locality and date only (2 lines): 1,000 labels, **10/6**; 2,000, **13/6**; 3,000, **16/6**.

Unequal quantities of localities, etc., or each additional line, in either style of type, **1/6 extra**.
Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations () () () () 100, **1/6**; 300, **3/-**.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

NATURAL HISTORY BOOKS AND SERIALS.

WHELDON & WESLEY, LTD.

have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers.

Large Collection of Entomological Books always in Stock.

Separate Catalogues on all subjects twopence each, post free.

Libraries or small parcels purchased.

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

Cloth, foolscap 8vo. Price 3s. 6d. Postage 4d.

POCKET-BOOK of BRITISH BIRDS

By **E. F. M. ELMS.**

"An inexpensive volume, which well deserves to be a 'pocket-book' for those who wish to become field ornithologists."—*Zoologist*.

"Contains more information on British Birds in a compact form than any book with which we are acquainted."—*The Auk*.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

WATKINS & TULLETT, Butterfly Art Store,

19, REGENT ST., LONDON, S.W. 1.

"EXOTIC" LEPIDOPTERA

AT REDUCED PRICES.

A few extracts of Rarities from our Spring Catalogue.

	♂			♀			♂			♀	
	s.	d.		s.	d.		s.	d.		s.	d.
PAPILIO						NESSÆA					
columbus, H. Sch. ...	17	0		25	0	hewitsoni, Fldr. ...	5	0		8	6
bachus, Fldr. ...	12	6		—	—	batesii, Fldr. ...	4	0		8	6
zagreus, Doubl. ...	10	0		—	—	obrinus, L. ...	3	0		—	—
homerus, F. ...	20	0		—	—	BATESIA					
mercedes, R. & J. ...	20	0		—	—	hypoxantha, S. & G. ...	12	6		—	—
inca ...	35	0		—	—	POLYGRAPHA					
orthosilaus, Weym. ...	20	0		—	—	cyanea, S. & G. ...	10	6		—	—
MORPHO						SIDERONE					
amphitriion, Stgr. ...	7	6		—	—	mars, Bates ...	5	0		—	—
metellus, Cr. ...	18	0		—	—	confluens ...	7	6		—	—
perseus, Cr. ...	20	0		—	—	CENOPHLEBIA					
hecuba, L. ...	18	0		60	0	archidona, Hew. ...	8	6		—	—
trojana, Rob. ...	6	0		10	0	ANÆA					
papirius, Hpff. ...	4	0		8	0	sosippus, Hpff. ...	3	6		—	—
zephritis, But. £10	10	0		—	—	lineata, Salv. ...	3	0		—	—
adonis, Cr. ...	18	0		—	—	divina, Stgr. ...	7	6		—	—
rhetenor, Cr. ...	20	0		60	0	nobilis, Bates ...	9	0		—	—
cacica, Stgr. ...	18	0		—	—	CASTNIA					
cypris, Westw. ...	12	6		—	—	syphax ...	8	0		—	—
menelaus, L. ...	9	0		18	0	cronida ...	20	0		—	—
melacheilus, Stgr. ...	12	6		—	—	pallatinus ...	10	0		—	—
eugenia (superb) ...	50	0		—	—	melanolimbata ...	7	6		—	—
" (pass) ...	20	0		—	—	<i>Indo-Australian.</i>					
CALLITHEA						PAPILIO					
depuiseti, Fldr. ...	4	0		9	0	elephenor, Dbl. ...	20	0		—	—
philotima, Rbl. ...	8	0		—	—	blumei, Bdv. ...	9	0		—	—
sapphira, Stgr. (pass)	25	0	pair	—	—	androcles, Bdv. ...	9	0		—	—
AGRIAS						weiskei, Ribbe ...	25	0		—	—
claudia sahlkei, Hons. ...	25	0	40	0	—	ARMANDIA					
lugina, Fruhst. ...	20	0	—	—	—	lidderdalei, Atkins ...	18	0		35	0
lugens, Stgr. ...	10	0	—	—	—						

MORPHOS cypris, amathonte, menelaus and didius, *Urania riphœus* and other showy butterflies supplied in large quantities. Write for prices.

G. A. BENTALL, *Naturalist,*

392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

Palæarctic, Indo-Australian, African, American Lepidoptera and other Insect Orders. Apparatus and Books.

STEVENS'S AUCTION ROOMS, LTD.

[Established 1760.]

TUESDAY, MAY 16th, at 12.30 o'clock.

BRITISH AND EXOTIC LEPIDOPTERA.

MR. J. C. STEVENS will sell by auction on the above date three collections of **British Lepidoptera**, including some extinct species and a few varieties.

A collection of **Exotic Lepidoptera**, including many rare species in fine condition; and a number of **Cabinets, etc.**

On view day prior and morning of sale.

Catalogues on application at

38, KING STREET, COVENT GARDEN, LONDON, W.C. 2.

LOCALITY LABELS

Printed by an Entomologist——for Entomologists!

Neat type. Accurate work. Labour-saving arrangement.

Send stamp (1d.) for Price List and Samples.

FRANK LITTLEWOOD (Dept. E), 22, HIGHGATE, KENDAL.

FOR SALE.—Entomological cabinet by good maker. Cork lined, camphor cells, etc. Lift glass tops. 17 drawers, $18\frac{1}{2}$ in. \times $28\frac{1}{2}$ in. \times $1\frac{3}{4}$ in. £20 f.o.r. Particulars on application. Also local made 15-drawer cabinet, $15" \times 22"$, glass tops. Suitable for beginner. Best offer over £10 f.o.r. Apply—

Capt. HAYWARD, Vicarage, Bruton.

Cloth, foolscap 8vo. Price 3s. 6d. Postage 4d.

POCKET-BOOK of BRITISH BIRDS

By E. F. M. ELMS.

"An inexpensive volume, which well deserves to be a 'pocket-book' for those who wish to become field ornithologists."—*Zoologist*.

"Contains more information on British Birds in a compact form than any book with which we are acquainted."—*The Auk*.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

NATURAL HISTORY BOOKS AND SERIALS.

WHELDON & WESLEY, LTD.

have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers.

Large Collection of Entomological Books always in Stock.

Separate Catalogues on all subjects twopence each, post free.

Libraries or small parcels purchased.

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

— A —

REVOLUTIONARY

Method of Collecting and Preserving all Forms of Small Insect Life—
without in any way injuring the specimen—

“THYMO-PLAS.”

The specimen is placed in an air-tight cell formed by a ring of “Thymo-Plas” and transparent covers. Complete Outfits 3/4 and 6/6 post free.

Full particulars and directions by Dr. Alfred Moore, F.E.S., on receipt of stamp.

HARBUTT'S PLASTICINE Ltd., 48, Bathampton, BATH.

E. & S. LIVINGSTONE, 16 & 17, Teviot Place, Edinburgh.

JUST PUBLISHED. Crown 4to. 344 Pages. 105 Illustrations. 15s. net. Postage 1s.

PRACTICAL ZOOLOGY

For Medical and Junior Students.

BY

J. D. F. GILCHRIST, M.A., D.Sc., Ph.D., AND C. von BONDE, M.A.,

Professor of Zoology in the University of
Cape Town.

Lecturer in Zoology in the University
of Cape Town.

The attractive features of the book are the particularly clear arrangement of the text, with the right-hand pages left blank to enable the student to draw up his own diagrams, and the remarkably fine execution of the 105 illustrations, most of which are entirely original and have been drawn from actual dissections.

Prospectus sent post free on application.

G. A. BENTALL, *Naturalist*,

392, Strand, London, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Price Lists sent without charge:

Palæarctic, Indo-Australian, African, American Lepidoptera and
other Insect Orders. Apparatus and Books.

NATURELAND

An Illustrated Magazine of Natural History.

The Magazine you have been waiting for
The Magazine that is different

PAPERS REVIEWS NOTES PHOTOGRAPHS

Prospectus from the Editor—

Dr. GRAHAM RENSHAW, Bridge House, Sale, MANCHESTER.

NOW READY. Demy 8vo, Cloth extra, 276 pp.; Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

Wanted.—Asiatic and African Butterflies, in papers; Coleoptera and full series British Humble Bees (fresh specimens preferred, pinned but unset). **In exchange for** S. American Lepidoptera (many bred) and other insects. Address for correspondence:—W. BUTHN, c/o F. C. BUTHN, *Caura, Tacarigua, Trinidad, B.W.I.*

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, 9/9; 2,000, 12/9; 3,000, 15/9.

Locality and date only (2 lines): 1,000 labels, 9/-; 2,000, 12/-; 3,000, 15/-.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, 12/-; 2,000, 15/-; 3,000, 18/-.

Locality and date only (2 lines): 1,000 labels, 10/6; 2,000, 13/6; 3,000, 16/6.

Unequal quantities of localities, etc., or each additional line, in either style of type, 1/6 extra. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations ( ) 100, 1/6; 300, 3/-.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

Thymoplas

MOUNTING OUTFITS.



A simple & permanent method
:: for mounting insects, etc. ::

Adopted by the Entomological Department,
— Royal College of Science, London. —

Price 3/- (postage 6d.), and 6/- (postage 9d.)

HARBUTT'S PLASTICINE,

56, Ludgate Hill, E.C. 4, LTD.,

Bathampton, nr. Bath.

Agent: G. A. BENTALL, F.Z.S.,

392, Strand, LONDON, W.C. 2.

Wanted.—Asiatic and African Butterflies, in papers; Coleoptera and full series British Humble Bees (fresh specimens preferred, pinned but unset). **In exchange for** S. American Lepidoptera (many bred) and other insects. Address for correspondence:—W. BUTHN, c/o F. C. BUTHN, Caura, Tacarigua, Trinidad, B.W.I.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

REVOLUTIONARY

Method of Collecting and Preserving all Forms of Small Insect Life—
without in any way injuring the specimen—

“THYMO-PLAS.”

The specimen is placed in an air-tight cell formed by a ring of “Thymo-Plas” and transparent covers. Complete Outfits 3/6 and 6/9 post free.

Full particulars and directions by Dr. Alfred Moore, F.E.S., on receipt of stamp.

HARBUTT'S PLASTICINE Ltd., 48, Bathampton, BATH.

WANTED, TO BUY OR EXCHANGE.—Catocalinæ, Sphingidæ, Arctiidæ, Saturnidæ and Ceratocampidæ from all parts of the world. Prompt payment. Specimens on approval solicited.—**MORTIMER L. J. HIGGINS, 1303, Pea St., N.W., Washington, D.C., United States.**

TO LET.—Comfortable Apartments. Good Table. Parties Catered for. Close to Fen. Apply—

MRS. NIXON,

“Red Lion,”

Wicken, Soham, Cambs.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, **9/9**; 2,000, **12/9**; 3,000, **15/9**.

Locality and date only (2 lines): 1,000 labels, **9/-**; 2,000, **12/-**; 3,000, **15/-**.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** (“Brilliant”), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, **12/-**; 2,000, **15/-**; 3,000, **18/-**.

Locality and date only (2 lines): 1,000 labels, **10/6**; 2,000, **13/6**; 3,000, **16/6**.

Unequal quantities of localities, etc., or each additional line, in either style of type, **1/6 extra**. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations (, ) (, ) 100, **1/6**; 300, **3/-**.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

NATURAL HISTORY BOOKS AND SERIALS.

WHELDON & WESLEY LTD.

have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers.

Large Collection of Entomological Books always in Stock.

Separate Catalogues on all subjects twopence each, post free.

Libraries or small parcels purchased.

2, 3 and 4, ARTHUR ST., NEW OXFORD ST., LONDON, W.C. 2.

Telephone: Gerrard, 1412.

WANTED.—A Second-hand 40-DRAWER INSECT CABINET. Must be in good condition and cheap.

G. H. GURNEY,

Keswick,

Norwich.

FOR SALE.—A nice little COLLECTION OF BRITISH COLEOPTERA, about 750 species in small cabinet and boxes, all properly arranged and labelled. Would make nice nucleus. Also small Collection of European Butterflies, mostly Swiss, and some fine South African ditto, together with about 2 dozen excellent air-tight store-boxes. Price the lot, £5, or would part them.

CANON NASH, STANDISH VICARAGE, GLOUCESTERSHIRE.

NATURELAND

An Illustrated Magazine of Natural History.

The Magazine you have been waiting for

The Magazine that is different

PAPERS REVIEWS NOTES PHOTOGRAPHS

Prospectus from the Editor—

Dr. GRAHAM RENSHAW, Bridge House, Sale, MANCHESTER.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

FOR SALE.—All fine specimens—*Lucina*, *Cinxia*, 2d.
Croceago, *Littoralis*, *Pudorina*, *Xerampelina*, *Ridens*, 4d.
Lychnitis, *Chaonia*, *Quadra*, 6d. *Alyecta*, *Ravida*, *Obsoleta*,
Craccæ, *Gueenei*, 9d. *Pruni*, *Connexa*, *Brevilinea*, 1/6 each.
Nearly every other species equally cheap. Many pupæ, none
inbred.

A. J. SPILLER, CHINNOR, WALLINGFORD.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, 9/9; 2,000, 12/9; 3,000, 15/9.

Locality and date only (2 lines): 1,000 labels, 9/-; 2,000, 12/-; 3,000, 15/-.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, 12/-; 2,000, 15/-; 3,000, 18/-.

Locality and date only (2 lines): 1,000 labels, 10/6; 2,000, 13/6; 3,000, 16/6.

Unequal quantities of localities, etc., or each additional line, in either style of type, 1/6 extra. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations ( ) ( ) 100, 1/6; 300, 3/-.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

FOR SALE.—'The Entomologist,' 1893 to 1896, bound vols.; 1897 to 1914 (except 1903), unbound vols., all complete except January and March, 1904. 'Entomologist's Monthly Magazine,' 1893 complete; 1894, July missing. 'Transactions of Entomological Society,' 1899, Parts I, II and III. 'Lloyd's Natural History—Butterflies,' by KIRBY, Parts I to XV. 'Natural History of British Moths,' 1860, Parts 14 to 17. 'Entomologist's Annual,' 1855, 1857, and 1866 to 1873. 'Handbook of British Lepidoptera,' by EDWARD MEYRICK, 1895. 'Handbook of Coleoptera,' by HERBERT E. COX, 2 vols., 1874. 'Naturalist's Library,' Vol. II—'Beetles,' by J. DUNCAN, 1835 (30 coloured plates). 'British Coleoptera,' by W. E. SHUCKARD, 1840 (94 beautiful plates). 'British Beetles,' by RYE and FOWLER, 1890. 'An Introduction to Entomology,' with plates, by KIRBY and SPENCE, 2 vols., 3rd edition, 1818. **What offers?**

CANON NASH, STANDISH VICARAGE, STONEHOUSE, GLOS.

ENTOMOLOGY or GENERAL Natural History Work

for Private Gentleman, sought by boy just left school.

Apply: **PRINCIPAL, S. Margaret's College, LOWESTOFT.**

COLLECTOR wishes to acquire privately, by purchase or exchange, a few good aberrational forms of British Butterflies. Write particulars to—

"H.V.R.," c/o R. A. KNIGHT & Co., Ltd., 1, Gresham Buildings, E.C.2.

FOR SALE.—'The Entomologist,' from 1878–1922 inclusive, uniformly bound up to 1914; last eight years unbound, but complete. Also 'Entomologist's Record,' vols. 1–17 inclusive, uniformly bound.

D. A. HILL, Vanessa Cottage, GREAT CLACTON, ESSEX.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

FOR SALE.—All fine specimens. Autumnaria, Mimosa, Munda, Gracilis, Rubricosa, Verbasci, Glareosa, Upsilon, Suspecta, Cerago, Chi, Plantaginis, Perla (vars.), Valligera, Advenaria, L. comma, Ziczac, 2d. each, 1/6 doz., assorted species. Socia, Fibrosa, Cespites, 4d. each. Valezina, Trepida, Chaonia, 6d. each. Abjecta, Ophiogramma, Leporina, Gueenei, Occulta, Radiata (var.), Flavescens (var.), 9d. each; etc., etc.

A. J. SPILLER, CHINNOR, WALLINGFORD.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, 9/9; 2,000, 12/9; 3,000, 15/9.

Locality and date only (2 lines): 1,000 labels, 9/-; 2,000, 12/-; 3,000, 15/-.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type** made ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, 12/-; 2,000, 15/-; 3,000, 18/-.

Locality and date only (2 lines): 1,000 labels, 10/6; 2,000, 13/6; 3,000, 16/6.

Unequal quantities of localities, etc., or each additional line, in either style of type, 1/6 extra. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations () () () () 100, 1/6; 300, 3/-.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

WANTED.

Small Collection of NORTH BRITISH COLEOPTERA.

FRED. F. WOOD, EASTONS, DITCHLING, SUSSEX.

CHANGES OF ADDRESS.—H. J. Burkill from 79, Cornhill, E.C. 3, to 3, Newman's Court, Cornhill, E.C. 3.—F. W. Frohawk from "Uplands," Thundersley, Essex, to c/o Dr. A. G. Butler, 124, Beckenham Road, Beckenham, Kent.—W. G. Sheldon from "Youlgreave," S. Croydon, to "West Watch," Limpsfield, Surrey.

TO CORRESPONDENTS.—All notes and papers intended for publication, books for review, etc., and notices of Exchange should be sent to—

N. D. RILEY, 5, BROOK GARDENS, BARNES, S.W. 13.

Contributors and correspondents requiring replies or acknowledgments are respectfully requested to enclose stamps.

Thymoplas

MOUNTING OUTFITS.



A simple & permanent method
:: for mounting insects, etc. ::

Adopted by the Entomological Department,
— Royal College of Science, London. —

Price 3/- (postage 6d.), and 6/- (postage 9d.)

HARBUTT'S PLASTICINE,

56, Ludgate Hill, E.C. 4, LTD.,

AND

Bathampton, nr. Bath.

Agent: G. A. BENTALL, F.Z.S.,

392, Strand, LONDON, W.C. 2.

BERNARD QUARITCH,

Natural History Bookseller

LTD.

Has always in Stock

A LARGE AND COMPREHENSIVE SELECTION
— OF BOOKS AND PERIODICALS ON —

Zoology, Botany, Geology, etc.

Recently Purchased

THE WHOLE OF THE REMAINING STOCKS OF THE

'Biologia Centrali Americana,' or 'Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America,'

— AND —

'Reports on the Scientific Results of the Voyage of
H.M.S. "Challenger" during the Years 1872-76.'

CATALOGUES SENT ON APPLICATION

11, Grafton St., New Bond St., London, W. 1.

NATURAL HISTORY BOOKS AND SERIALS.

WHELDON & WESLEY LTD.

have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers.

Large Collection of Entomological Books always in Stock.

Separate Catalogues on all subjects twopence each, post free.

Libraries or small parcels purchased,

2, 3 & 4, ARTHUR STREET, NEW OXFORD STREET, LONDON, W.C. 2.

Telephone: Gerrard 1412.

WANTED.

SEITZ' 'PALÆARCTIC LEPIDOPTERA.'

English Edition.

ALBERT F. ROSA, M.D., 28, PITT STREET, EDINBURGH.

A FEW FINE ABERRATIONS OF BRITISH BUTTERFLIES

For Sale.

Wild and Bred, including rare and unusual forms. Guaranteed British Only.

G. B. OLIVER, OXFORD STREET, HIGH WYCOMBE.

FOR SALE.—All fine specimens, per each. Monacha, Salicis, Pini-perda, Lunaria, Illustraria, Tiliaria, 2d.; Unanima, Herbida, Glauca, 3d.; Fascelina, P. populi, Neglecta, Erosaria, Aceris, Croceago, Tincta, Orion, 4d.; Quadra, Trepida, 6d.; Caniola, Abjecta, Sobrina, Subsequa, Ravida, 9d.; Chryson, Rubiginea, 1/6; Xanthomista, Empyrea, 2/6, etc.

A. J. SPILLER, CHINNOR, WALLINGFORD.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

1922.

U, Vol. 55

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 1449

BHL